

*"tools for more effective training"*

**OPERATION AND MAINTENANCE GUIDE**  
**for**  
**RADAR SIGNAL INTERFERENCE TRAINER (X-BAND)**

DEVICE 15X12

*AN/ULT*

NAVEXOS P-1856



**U.S. NAVAL TRAINING DEVICE CENTER**  
**PORT WASHINGTON, L.I., NEW YORK**





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OPERATION AND MAINTENANCE GUIDE  
FOR  
RADAR SIGNAL INTERFERENCE TRAINER (X-BAND)  
DEVICE 15X12

Manufactured by

Polarad Electronics Corporation  
43-20 34th Street  
Long Island City 1, New York  
Contract No. N61339-29

for the

UNITED STATES ARMY

through

U. S. NAVAL TRAINING DEVICE CENTER  
PORT WASHINGTON, NEW YORK

1 July 1958



# newly approved method of artificial respiration

The Holger-Nielson method of artificial respiration has been adopted by the Armed Forces and the Red Cross as the most efficient of the many resuscitation methods now in existence.

A step-by-step explanation of the new technique is reprinted below.



1. **POSITION OF THE SUBJECT:** Place the subject in the face down, prone position. Bend his elbows and place the hands one upon the other. Turn his face to one side, placing the cheek upon his hands.

2. **POSITION OF THE OPERATOR:** Kneel on either the right or left knee at the head of the subject, facing him. Place the knee at the side of the subject's head close to the forearm. Place the opposite foot near the elbow. If it is more comfortable, kneel on both knees, one on either side of the subject's head. Place your hands upon the flat of the subject's back in such a way that the palms lie just below a line running between the armpits. With the tips of the thumbs just touching, spread the fingers downward and outward.



3. **COMPRESSION PHASE:** Rock forward until the arms are approximately vertical and allow the weight of the upper part of your body to exert slow, steady, even pressure downward upon the hands. This forces air out of the lungs. Your elbows should be kept straight and the pressure exerted almost directly downward on the back.



4. **EXPANSION PHASE:** Release the pressure, avoiding a final thrust, and commence to rock slowly, backward. Place your hands upon the subject's arms just above his elbows, and draw his arms upward and toward you. Apply just enough lift to feel resistance and tension at the subject's shoulders. Do not bend your elbows, and as you rock backward the subject's arms will be drawn towards you. Then drop the arms gently to the ground. This completes the full cycle. The arm-lift expands the chest by pulling on the chest muscles, arching the back, and relieving the weight on the chest.



The cycle should be repeated 12 times per minute at a steady, uniform rate. The compression and expansion phases should occupy about equal time; the release period being of minimum duration.

5. **ADDITIONAL RELATED DIRECTIONS:** It is important that artificial respiration, when needed, should be started quickly. There should be a slight inclination of the body in such a way that fluid drains better from the respiratory passage. The head of the subject should be extended, not flexed forward, and the chin should not sag lest obstruction of the respiratory passages occur.

A check should be made to ascertain that the tongue or foreign objects are not obstructing the passages. These aspects can be cared for when placing the subject into position or shortly thereafter, between cycles.

A smooth rhythm in performing artificial respiration is desirable, but split-second timing is not essential. Shock should receive adequate attention, and the subject should continue to rest after resuscitation until seen by a physician or until recovery seems assured.





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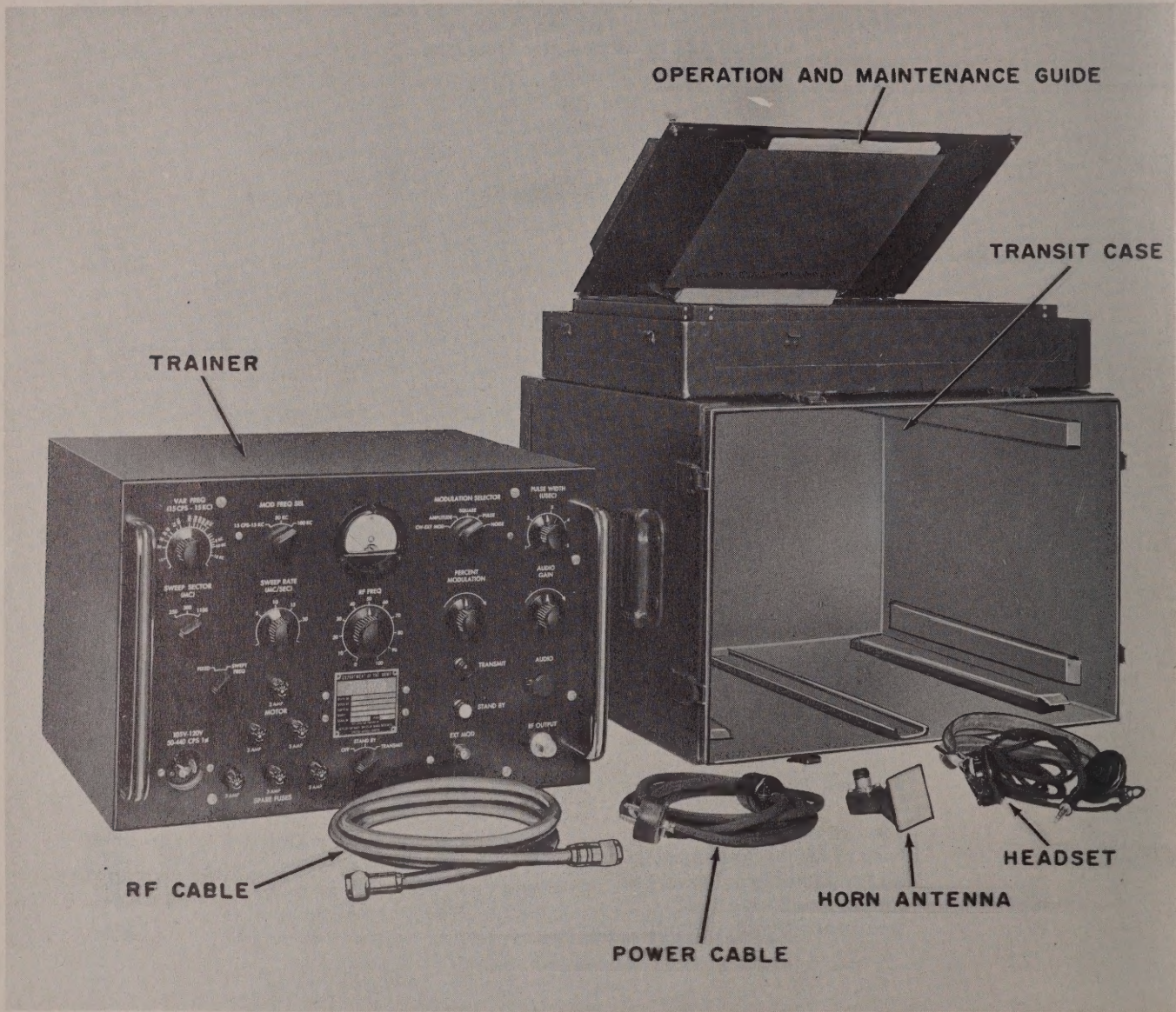


Figure 1-1. Radar Signal Interference Trainer (X-Band) Device 15X12



# E IN INSTRUCTION BOOK

Training For The 15 X 12 Jammer

**Do Not Remove**

1. The following procedures and situations outlined below are suggested as possible methods of using the trainer in this training program. Depending on the particular training situation, the instructor should choose those procedures best suited to his purpose.

m \$5

## 2. Use in Classroom.

It is suggested that if the students number more than four (4) the instruction period should be held in a classroom. The instructor can better display the trainer-jammer to the full advantage of all the students. During this period of training the instructor should explain the functions and uses of all controls and indicating devices.

## 3. Use in Radar Van.

When training is to be accomplished in the van it is suggested that the number of students not exceed five (5) at any one time. Assigning two (2) students to the trainer-jammer and three (3) students placed at the console where one student operates the range, one student the Azimuth, and the third student operates the Elevation Controls. The Azimuth Operator will take the anti-jam tactics necessary to reduce or cancel the different types of jamming. Of the two (2) students placed at the trainer-jammer one will operate the jammer while the second student observes.

## 4. Suggested Procedures for Training Demonstrations

Demonstration number	Demonstrate	Results
1.	Demonstrate the effect of CW interference	The radar transmitter pulse, noise (Grass), and the target echo will disappear if the strength of the interference is strong enough
2.	Demonstrate the effect of turned and unturned CW signals	Interference appears only at synchronous frequencies. (On some radars, interference may appear at the image frequency).
3.	Demonstrate tracking through interference by varying frequency of radar Set.	Depending on the relative power of the target echo and trainer signals, target echo may appear through interference.



Demon-  
stration  
number

Demonstrate

Results

4	Demonstrate tracking through interference by varying frequency of radar Set.	Interference appears at synchronous frequency and disappears at any non-synchronous frequency.
5	Demonstrate CW interference in a swept frequency.	Students observes periodic interference on radar set. Target echo may be lost.
6	Demonstrate the affect of Sweep Sector.	Trainer swept through full range will jam radar. At 500 mc or 250 mc Sectors, swept CW may or may not jam radar, depending on the setting of RF Frequency control.
7	Demonstrate the effect of sweep rate.	Interference signal sweep rate will vary.
8	Demonstrate interference by amplitude modulated signals.	The radar display portrays many super-imposed sine waves, partially or completely obscuring target echo. At very high trainer modulation frequencies, the target echo may be completely lost.
9	Demonstrate interference by square wave modulated signal.	The radar display portrays many super-imposed Square waves, partially or completely obscuring target echo. Target echo may be completely lost.
10	Demonstrate interference by Pulse Modulated Signals.	The radar display portrays pulses partially or completely obscuring target echo. Target echo may be completely lost.
11	Demonstrate interference by noise modulated signal.	The radar display portrays "grass", partially or completely obscuring target echo. Target echo may be completely lost.

##### 5. Drills and Problems.

After the trainers read through the jammed Radar, the instructor can make the trainer signal even more complet by increasing the sweep rate, or the modulation frequency, or the percentage of modulation, or any combination thereof, to jam the radar set once more. The student must then read through the interference again. These drills should be made more and more complex for each type of signal characteristic. The drills should be continued and repeated until the trainees have become proficient in reading a jammed radar.



#### 6. Testing.

In addition to the question and answer period the instructor should give tests to his trainees in the art of tracking-through, under jammed signal conditions. These tests should be based on classroom and field lectures and demonstrations. A number of tests should be given from time to time so that the trainees progress may be observed and weaknesses corrected.







## INTRODUCTION

This guide describes the theory of operation and the procedures necessary to install, operate, maintain and repair Radar Signal Interference Trainer (X-Band) Device 15X12. The trainer is a low power transmitter used to provide various types of interference signals necessary to instruct student radar operators in anti-jamming procedures. This guide also includes material to aid the instructor in utilizing the trainer in the training program.

## SECTION I

## GENERAL DESCRIPTION

## 1-1. TYPE OF DEVICE.

1-2. Radar Signal Interference Trainer (X-Band), Device 15X12, is a low-power radar transmitter capable of generating and transmitting various types of interference signals in the 8500 to 9600 mc radar X-Band. (See figure 1-1.) Device 15X12 (hereafter called the trainer) is designed to operate in conjunction with an X-Band radar and enables an operator to practice anti-jamming techniques. The carrier signal which it transmits can be manually tuned to the frequency of the radar set and modulated in amplitude by a sine wave, square wave, pulse, noise, or modulation from an external source. The signal frequency is variable and can be set to any fixed frequency within the X-Band. A swept signal frequency within the X-Band is also available.

## 1-3. APPLICATION TO TRAINING.

1-4. The trainer operating controls are calibrated, and thus permit an instructor to re-create identical jamming signals for individual students. The effect of each type of jamming signal on the radar set can be observed, and anti-jamming techniques can thus be practiced and developed.

## 1-5. TRAINER SIGNAL CHARACTERISTICS.

1-6. The characteristics of the transmitted signal may be adjusted with front panel controls. These characteristics are cw (continuous wave) frequency, sweep rate, sweep sector, percent modulation, type of modulation, and pulse width.

## 1-7. PHYSICAL ASPECTS.

1-8. Radar Signal Interference Trainer (X-Band) Device 15X12 is manufactured by the Polarad Electronics Corporation, 43-20 34th Street, Long Island City 1, N. Y., under contract number N61339-29.

1-9. The trainer consists of a panel-chassis assembly and blower enclosed in a painted aluminum dust cover. It is stored and carried in a shock-resistant transit case with removable cover. Secured in the transit case cover are the Operation and Maintenance Guide and accessories. The accessories (figure 1-2) consist of a horn antenna, power cable, an rf cable and headset. The trainer, when enclosed in its olive-drab transit case, is carried by means of hinge-type handles located at each side of the case.

1-10. The trainer is made up of five sections: power supply, modulator (containing four modulating signal circuits and a sweeping circuit), rf section (containing a klystron oscillator, tube mount, horn antenna and wave guide), keyer, and audio amplifier.

1-11. The front panel (see figure 2-1) features eleven operating controls which can be used by the instructor to select the type of interference signal desired. It also mounts receptacles for input power; operating, blower, and spare fuses; and external modulation, rf and audio output connectors.



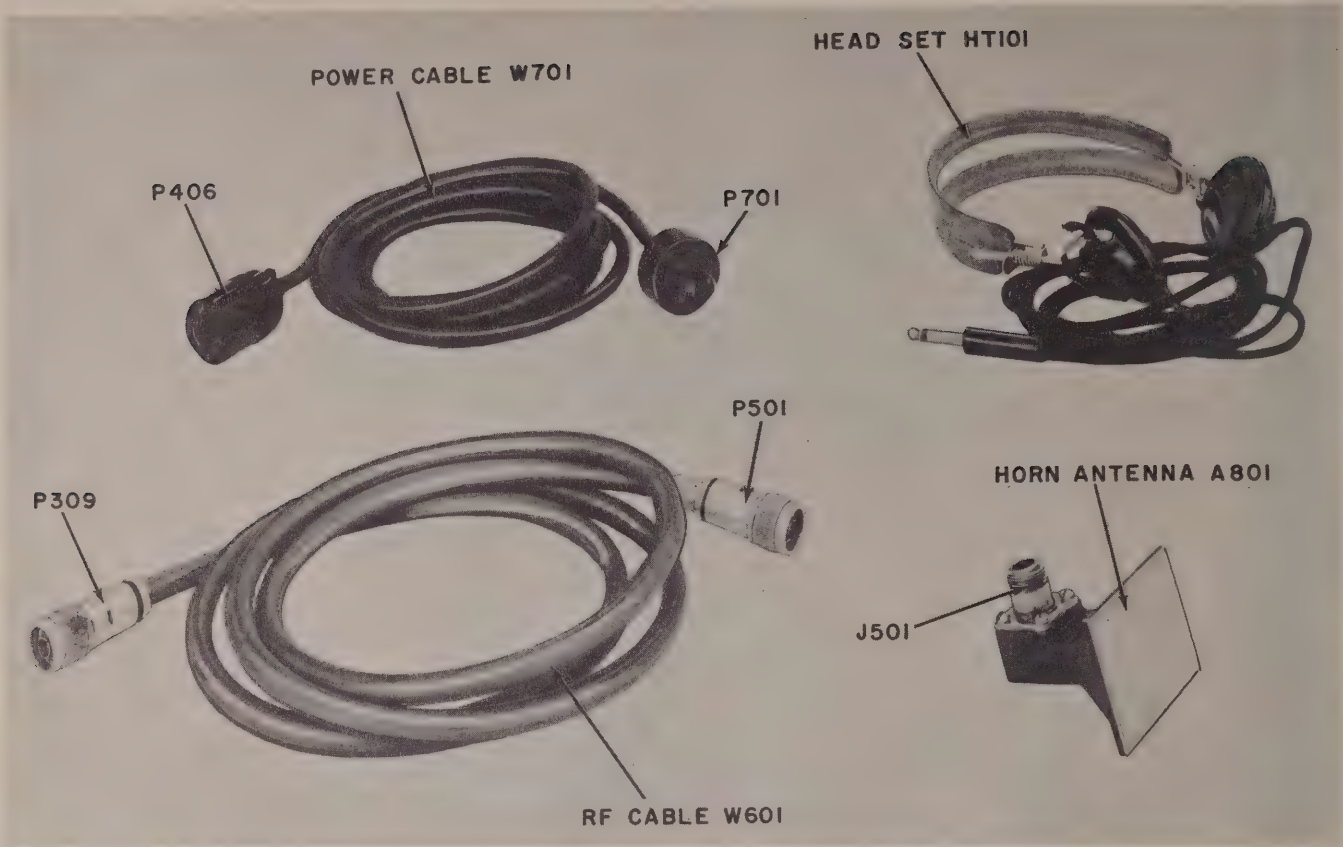


Figure 1-2. Trainer Accessories

1-12. EQUIPMENT SUPPLIED.

1-13. Refer to table 1-1 for the quantity, type and physical characteristics of the equipment supplied with the trainer.

1-14. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

1-15. The following equipment is required but not supplied with the trainer:

- a. A power source of 105 to 120 volts, 50 to 440 cps, single phase, capable of delivering 500 watts, is required for operation of the trainer.
- b. A radar set operating within the X-Band.
- c. A target.
- d. Repeater displays, as required.

TABLE 1-1. EQUIPMENT SUPPLIED

QTY	UNIT	NAVY DESIGNATION	OVERALL DIMENSIONS (Inches)	WEIGHT (Lbs)	NUMERICAL SERIES
1	Radar Signal Interference Trainer Device	15X12	19-23/32 by 13-25/32 by 19-23/32	95.0	101-801
	Accessories:				
1	Horn Antenna		2-1/2 by 2-3/8 by 2	0.25	800
1	Headset			0.5	100
1	RF Cable			1.0	700
1	Power Cable			2.0	600
1	Transit Case			35.0	



SECTION II  
OPERATION

## 2-1. GENERAL.

2-2. The instructor should be thoroughly familiar with the trainer's capabilities, purpose and limitations. This section is written to enable both the student and instructor to become more proficient in operating the trainer and in obtaining the necessary signal characteristics required to practice anti-jamming techniques.

## 2-3. TRAINER CONTROLS, INDICATORS, AND CONNECTORS. (See figure 2-1.)

2-4. The front panel controls are listed in table 2-1 exactly as marked on the trainer. Each control function is clearly explained and referenced to its corresponding number as designated in figure 2-1.

2-5. The trainer indicators and connectors are listed in table 2-2 as marked on the trainer. The function of each front panel indicator and connector is clearly explained and referenced to its corresponding number as designated in figure 2-1.

TABLE 2-1. FRONT PANEL CONTROLS

CONTROL NO. (See figure 2-1)	NAME OF CONTROL AND POSITIONS	FUNCTION
1	Power OFF STAND BY TRANSMIT	Unit Power Control Power OFF position Energizes tube filaments Energizes transmitting circuits
3	MODULATION SELECTOR CW-EXT MOD  AMPLITUDE SQUARE PULSE NOISE	Selects one of five modes of modulation CW alone or adds external modulation to carrier signal Amplitude modulates the cw signal Adds square wave to cw Adds pulse to cw Adds noise to cw
4	FIXED-SWEPT FREQ	Selects fixed or swept frequency
6	AUDIO GAIN	Volume control for audio output
7	RF FREQ	Controls carrier frequency (8500 mc to 9600 mc) on scale marked 0 to 100; for tuning interference signal to student-operated radar set
9	MOD FREQ SEL  15 CPS - 15 KC  50 KC 100 KC	Selects the modulation frequencies for the type of modulation selected Connects VAR FREQ selector range of 15 cps to 15 kc Fixes modulation frequency at 50 kc Fixes modulation frequency at 100 kc
10	VAR FREQ (15 CPS-15KC)	Selects modulator frequency on logarithmic scale from 15 cps to 15 kc
11	PERCENT MODULATION	Selects percent of amplitude modulation for AMPLITUDE and NOISE modulation only

TABLE 2-1. FRONT PANEL CONTROLS (cont)

CONTROL NO. (See figure 2-1)	NAME OF CONTROL AND POSITIONS	FUNCTION
12	PULSE WIDTH (USEC)	Selects pulse width of from one to five microseconds.
13	SWEEP SECTOR (MC)	Selects 250 mc, 500 mc, or 1100 mc sweep sector.
14	SWEEP RATE (MC/SEC)	Selects rate of change of carrier frequency from 5 mc/sec to 16 mc/sec.

TABLE 2-2. FRONT PANEL INDICATORS AND CONNECTORS

CONTROL NO. (See figure 2-1)	INDICATOR OR CONNECTOR	FUNCTION
2	TRANSMIT	Light indicates power on to all circuits.
5	STAND BY	Light indicates power on to filaments.
8	Power Monitor Meter	Indicates transmission of rf power.
15	105V-120V, 50-440 CPS, 1 $\phi$	Input connector for power supply.
16	AUDIO	Phone jack for headset.
17	RF OUTPUT	Connector used for attaching trainer to horn antenna.
18	EXT MOD	Input connector for external modulating signal.

## 2-6. PRECAUTIONS TO BE OBSERVED.

2-7. If the trainer signal is SWEPT FREQ operated with the SWEEP SECTOR selector in the 1100 position, care must be exercised to set the RF FREQ control to the midpoint (50) of the X-Band. Should the operator fail to observe this precaution, the trainer signal may overlap the limits of the X-Band, or the klystron oscillator may become inoperative at the limits of the sweep.

2-8. The power monitor meter indicates the average power of the signal being transmitted. During square wave transmission, the trainer is operated at half the duty cycle of cw transmission. Therefore, during square wave transmission, the meter indicates half the average power of cw transmission. In pulse transmission, the duty cycle is a very small fraction of the transmission time. Therefore, in this mode of operation, the meter will read a minimal amount.

## 2-9. OPERATION OF THE EQUIPMENT. (See figure 2-1.)

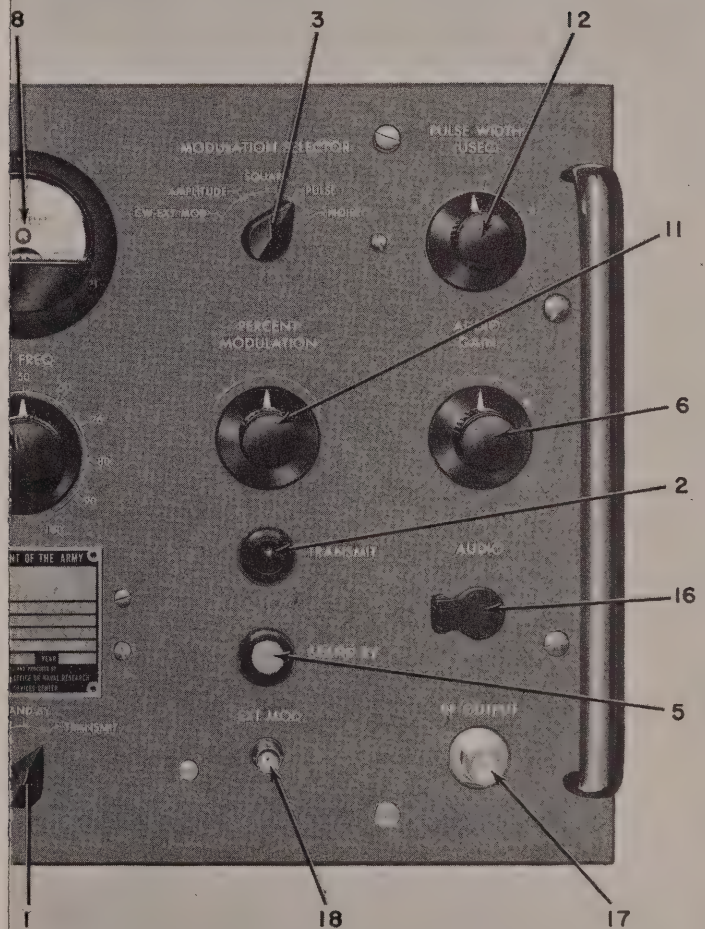
### CAUTION

Do not operate the trainer while it is still enclosed in its transit case. Operating the trainer in its case will result in frequency instability and equipment damage.

2-10. The sequence of operation for starting the trainer is as follows:

- a. Turn the power switch (1) to TRANSMIT. The red TRANSMIT power lamp (2) will glow.
- b. Set the MODULATION SELECTOR switch (3) to CW-EXT MOD; set the FIXED-SWEPT FREQ switch (4) to FIXED.





### ference Trainer, Front Panel

TABLE 2-1. FRONT PANEL CONTROLS (cont)

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2-10. The sequence of operation for starting the trainer is as follows:

- Turn the power switch (1) to TRANSMIT. The red TRANSMIT power lamp (2) will glow.
- Set the MODULATION SELECTOR switch (3) to CW-EXT MOD; set the FIXED-SWEPT FREQ switch (4) to FIXED.



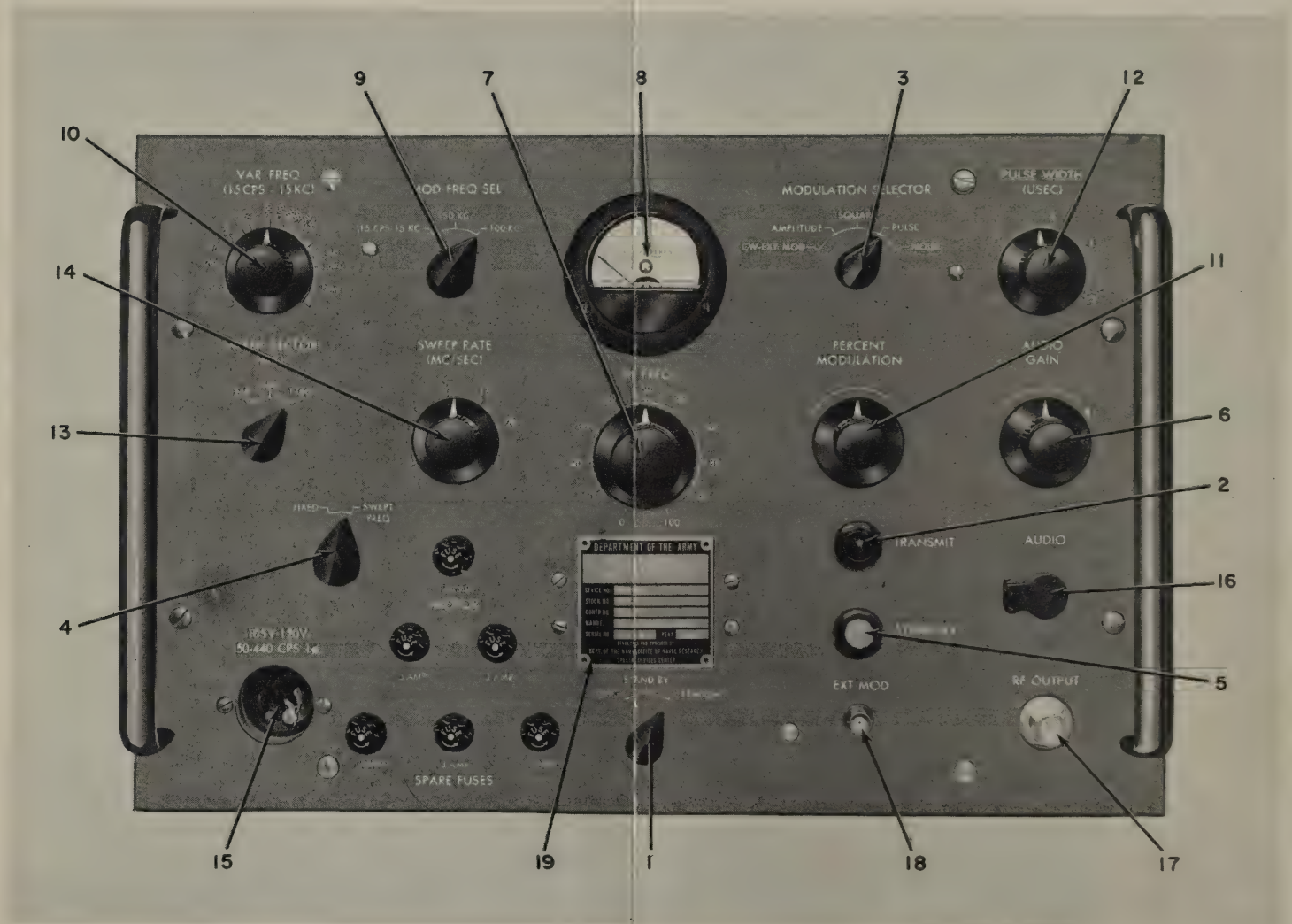


Figure 2-1. Radar Signal Interference Trainer, Front Panel





c. Allow a 20-minute warm-up period. The power monitor meter will indicate whether the trainer klystron oscillator is operating. Proper operation of the klystron oscillator will be indicated by readings of 0.5 to 2.5 ma (depending on the frequency) for CW-FIXED FREQ operation; 0.25 ma to 1 ma for AM-PLITUDE, NOISE or SQUARE modulation; PULSE modulation indications are negligible (see paragraph 2-8). (Turning the power switch (1) to STAND BY will keep the tube filaments lighted and cause the amber STAND BY power lamp (5) to glow.)

2-11. With the trainer started and the power switch (1) in the TRANSMIT position, turn the AUDIO GAIN control (6) clockwise until a faint signal is audible in the headset. If no signal is heard, tune the trainer to the radar set frequency by turning the RF FREQ control (7) slowly, in steps of ten, from 0 to 100.

#### NOTE

The RF FREQ control must be turned very slowly and allowed to remain at each step for several minutes. Then, if no signal is heard in the headset, continue to the next step and repeat the tuning procedure until a signal is heard.

2-12. Continue tuning the trainer until a maximum audio output is heard in the headset. The cw output of the trainer is now at the same operating frequency as the radar set. Power monitor meter (8) will indicate whether the trainer is transmitting. Some radars, essentially those whose receivers do not employ preselection, may be sensitive to image frequency response. In this case, the radar may be jammed at a frequency which does not coincide with the trainer's transmitting frequency, although the radar acts as if it were being jammed by the trainer's fundamental transmitting frequency.

#### NOTE

Maintain the temperature within the trainer as constant as possible to stabilize the transmitting frequency. Extreme temperature changes will tend to change the operating frequency and require continuous readjustment of the RF FREQ control.

2-13. When the trainer and radar set transmission frequencies are synchronously tuned, modulation may be applied to the trainer carrier wave. Turn the MODULATION SELECTOR switch (3) to the desired type of modulation.

#### NOTE

The radar signal is heard in the headset only during cw operation of the trainer.

2-14. Make the following adjustments according to the type of signal selected:

- For CW-EXT MOD operation, there are no additional adjustments.
- For AMPLITUDE modulation, set the MOD FREQ SEL switch (9) to the desired frequency position. If the 15 CPS-15 KC position is selected, set the VAR FREQ switch (10) to the desired frequency. Set the PERCENT MODULATION control (11) to the desired amount of modulation.
- For SQUARE wave modulation, set the MOD FREQ SEL switch (9) to the desired frequency position. If the 15 CPS-15 KC position is selected, set the VAR FREQ control (10) to the desired frequency.
- For PULSE modulation, set the MOD FREQ SEL switch (9) to the desired frequency position. If the 15 CPS-15 KC position is selected, set the VAR FREQ control (10) to the desired frequency. Set the PULSE WIDTH control (12) to indicate the desired pulse width.
- For NOISE modulation, set the PERCENT MODULATION control (11) to the desired amount of modulation.

2-15. If sweeping of the cw frequency is desired, turn FIXED-SWEPT FREQ switch (4) to SWEPT FREQ and set the SWEEP SECTOR switch (13) to the desired sector width (see paragraph 2-7). Set the SWEEP RATE control (14) to the desired rate of sweep.

#### 2-16. INTERNAL ADJUSTMENTS.

2-17. Internal adjustments are not to be made by operating personnel. Only experienced maintenance personnel are authorized to make internal adjustments. (See paragraph 7-14 for instructions pertaining to these adjustments.)

#### 2-18. PRE-OPERATING INSPECTION.

2-19. Before using the trainer, the instructor should ascertain that the equipment is in good working condition. Set up the trainer and radar set before giving the training session. Follow the instructions of paragraph 2-9 and note whether each trainer control has the proper result on the radar set in use. A good pre-instruction check of the trainer is a run-through of the demonstrations and results listed in table 4-1.

#### CAUTION

Make sure the blower is operating at all times and that all louvers are clear and unobstructed. Never operate the trainer while it is in the transit case.

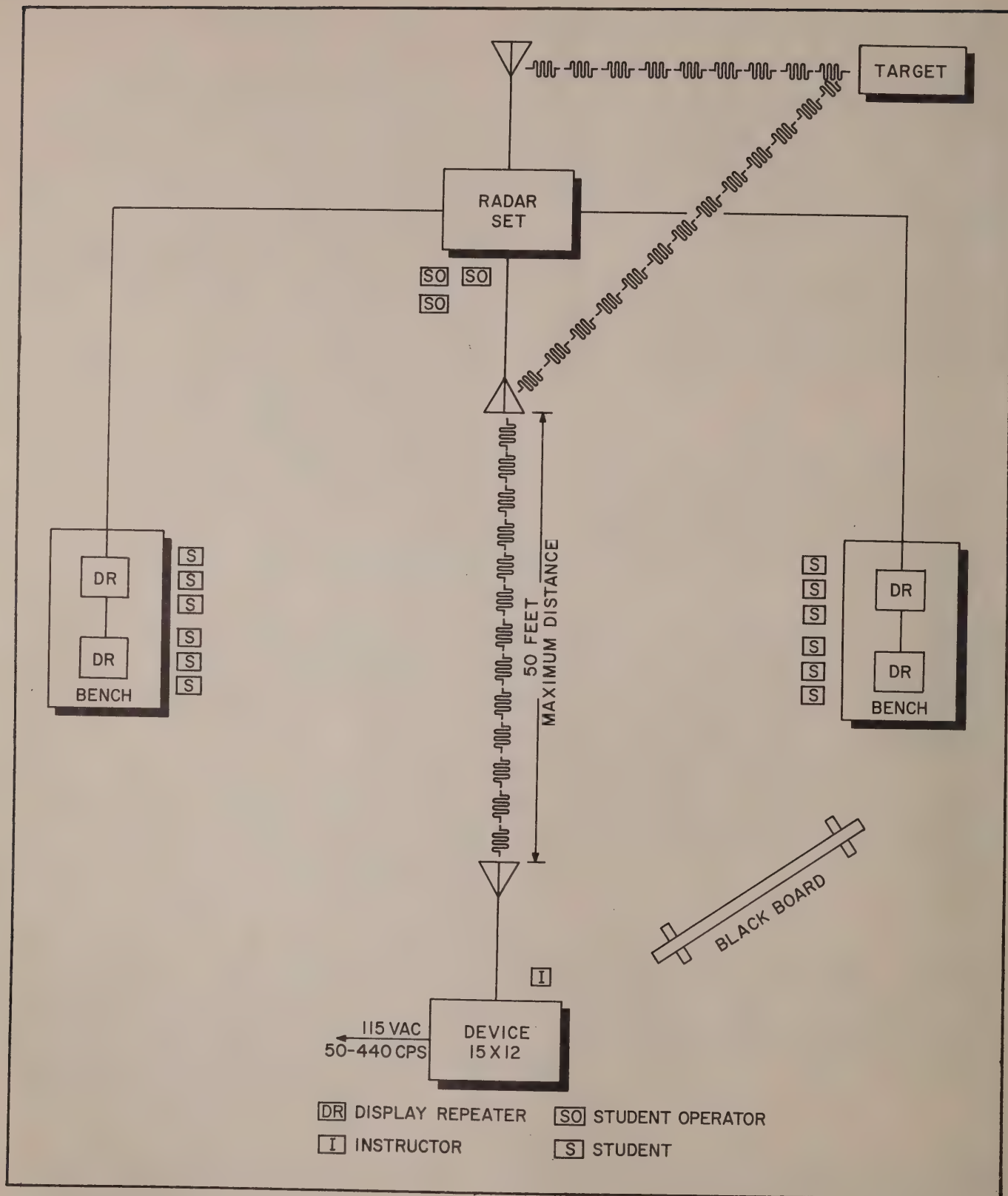


Figure 3-1. Block Diagram Showing Classroom Training, Typical Situation



## SECTION III

## THE DEVICE AS AN AID TO TRAINING

## 3-1. TRAINING SITUATIONS, GENERAL.

3-2. Students should have knowledge of the theory of jamming and anti-jamming, and be proficient in the use of the radar set being studied. If operational difficulties arise in the use of the radar set, refer to its instruction manual. The trainer is designed to be used in the classroom or in the field, within 50 feet of a radar set operating in the 8500 to 9600 mc (X-Band) frequency range.

## NOTE

The procedures and situations outlined in Sections III and IV of this guide are suggested as possible methods of using the trainer in the training program. Depending on the particular training situation, the instructor should choose those procedures best suited to his purpose.

3-3. The calibrated front-panel controls allow the instructor to recreate identical interference signals at various stages of the training. He may repeat these signals for different students as they take their turn in operating the radar set. This feature of the trainer allows the instructor to evaluate each student's ability in recognizing and tracking-through interference signals whose characteristics are pre-determined. The instructor, for example, can set the trainer controls for an amplitude modulated signal, swept through the entire X-Band at a rate of 5 mc per second, and duplicate this signal at a later class for each student, for the purpose of evaluating student's progress in absorbing the anti-jamming techniques. This signal or any combination of signal characteristics can be repeated as often as is necessary.

## 3-4. USE IN THE CLASSROOM.

3-5. The radar set and the trainer may be set up in the classroom (see figure 3-1). In this situation, the instructor operates the trainer and jams the radar set. He then re-tracks the target with the radar set and demonstrates anti-jamming techniques. This procedure can be repeated as often as is necessary for the available types of signal characteristics offered by the trainer. Section IV includes a list of demonstrations designed to teach the recognition of the various types of interference signals and the measures taken to "track-through" (to switch the frequency of a radar set, or re-track the target, or take any other measures necessary to continue tracking the target). The instructor then continues

to operate the trainer and transmits various interference signals while three students observe the Range, Elevation and Azimuth scopes and operate the radar set. The instructor aids the students in tracking-through the interference until the students have acquired the necessary skill. Repeater displays may be used to allow a greater number of students to observe the effect of jamming and the anti-jamming techniques. The instructor can tell the class what adjustments he is making on the trainer, such as changing the sweep sector, and the class can then see the effects of various types of signals on individual displays, as well as the effectiveness of the anti-jamming procedures. Students can be rotated in their roles of radar operators and display observers.

3-6. The use of repeater displays, however, sets an additional limitation to the student's absorption of the anti-jamming techniques, because the students using the repeater displays do not directly observe the radar set's operation when anti-jamming techniques are practiced. It is of utmost importance that each student obtain as much practice as possible with the radar set controls. It must be remembered that the effectiveness of classroom training is limited primarily by the individual time each student is allowed to practice anti-jamming techniques on the radar set proper, and the length of time devoted to this section of the radar training program.

## 3-7. USE IN THE FIELD.

3-8. The trainer is adaptable for use in the field to demonstrate a training situation similar to that actually encountered in a tactical situation. If field training is preceded by classroom training with the trainer, a qualified student can operate the trainer while the instructor and the other students observe the operation of the radar set.

3-9. The training methods described under the classroom situation can be used in the field. Effectiveness will be limited by the lack of repeater displays and thus by the number of students who can observe the operation of the radar. It may also be limited by difficulty in communicating with the trainer operator. Training time in the field as compared to classroom training, will be limited also by the time consumed getting the equipment into position and setting it up. If the trainer is set up near a radar set, the instructor can move between the two sets to function both as the trainer operator and instructor in the use of the radar set.

3-10. In field use, the limitation of distance between the trainer operator (instructor) and the trainee (student) becomes more important because direct observation of the trainee's anti-jamming technique by the instructor may become more difficult. Where, in classroom training, they are in close proximity and each can observe the other's actions more closely, field conditions may prevent this close observation.

3-11. An effort should be made to set up the trainer so that the instructor can operate the trainer and still observe the students' actions in de-jamming the radar set. The instructor will thus be able to make on-the-spot corrections of the students' de-jamming procedure, if required. If this becomes difficult due to such conditions as fixed radar set and antenna location, auxiliary communication between the instructor and the trainee (such as a telephone line) may be required. In most radar installations, telephone communications are available between the radar set and the radar antenna.

3-12. When a situation exists where antenna propagation is difficult or the trainer has no effect, it should be first determined that the radar set is operating properly. Refer to the radar set instruction manual. If the radar set is operating properly, move the trainer antenna closer to the radar antenna. The location of the trainer antenna, in respect to the radar antenna, is important to the effectiveness of the trainer. For effective jamming, the trainer antenna should be as close to the radar antenna as possible to provide for the maximum transfer of jamming signal energy. If the trainer has no effect, refer to paragraph 7-13, trouble-shooting.

3-13. In field use, where direct observation of the radar set and trainer frequencies is not possible due to physical limitations, and where use of the audio output of the trainer for synchronization of these frequencies is not desired, the frequencies may be synchronized as follows:

- a. Set the radar set into operation.
- b. Set the trainer into operation.
- c. Observe the scan of the radar antenna.
- d. Vary the frequency of the trainer set until the radar antenna ceases to scan in a definite pattern and begins to hunt and waver.

### 3-14. PLACEMENT OF THE TRAINER IN THE RADAR TRAINING PROGRAM.

3-15. The trainer is designed for use in a radar operator training program or in organizational anti-jamming technique drills. If used in the training program, the anti-jamming instruction should be given in the latter portion of the course. The trainee is then familiar with the radar set, its function, and operating controls. If used to train experienced operators, the trainer may be used at any time except during operational tactics.

3-16. In organizational use, the trainer proves effective in sharpening individual operator and radar crew teamwork. In anti-jamming operations, the Range, Azimuth and Elevation scope operators must work together to read through the jamming to track the target. Since the trainer is an rf device, its operation is entirely independent of the radar set proper and it may be turned off at a moment's notice. No connections between the trainer and the radar set are necessary. This feature makes the trainer ideal for training radar operators in anti-jamming techniques at the organizational level, where with very short notice, the radar may have to be used for tracking an unidentified or enemy target. The trainer easily lends itself to operation in the tactical situations listed in table 3-1.

### 3-17. LENGTH OF TRAINING TIME.

3-18. The length of time required to train an operator in anti-jamming techniques will vary among individual trainees. The length of training time is relative to the individual trainee's aptitude and his ability to absorb the anti-jamming technique. On the average, three weeks of training, consisting of instruction, demonstration, individual practice and class participation, should be sufficient to train an operator or student in anti-jamming techniques. On the organizational level, anti-jamming techniques should be practiced at regular intervals. A program should be set up to integrate anti-jamming training on a continual basis so that radar operators do not lose their skill in tracking jammed targets.

TABLE 3-1. TACTICAL SITUATIONS

*SITUATION	DESCRIPTION	TRAINER OPERATION
a	Operational	No
b	Standby Operation	Yes
c	Training Operation	Yes
d	Maintenance Operation	Yes

\*Situation a (operational). Training not recommended while actually tracking unidentified targets.

\*Situation b (standby operation). Training recommended while radar crews are standing by, preparatory to drills, training, or operation.

\*Situation c (training operation). Training highly recommended during this period.

\*Situation d (maintenance operation). Training recommended to establish recognition of a deficient radar set symptom. A defective radar set may also cause loss of a target on the display.



## SECTION IV

## PROBLEMS, EXPERIMENTS, DEMONSTRATIONS

## 4-1. GENERAL.

4-2. To increase the educational value of the trainer, the instructor should precede each training session with a preview of the material to be presented and, after each training session, he should review the instructional material presented. This may include an outline of the instructional material, explanation of new terms or expressions and phenomena demonstrated, a question and answer period, and criticism of the student's performance in practicing anti-jamming techniques.

4-3. Table 4-1 lists several problems and means of demonstrating them, to familiarize students with aspects of jamming and anti-jamming measures.

## 4-4. EQUIPMENT PREPARATION.

4-5. Prior to conducting the demonstrations listed in table 4-1, the instructor should, preferably with

the aid of his students, connect repeater displays to the radar set. The radar set and trainer should then be put into operation and a quick run-through made of the demonstrations listed in table 4-1 to determine that both are in good operating condition. This will assure that proper results are obtained for each demonstration and that the lecture can continue uninterrupted.

4-6. After the equipment has been checked and prepared, the instructor may demonstrate to the students the effect various jamming signals have on the radar scope's target display. Table 4-1 suggests a number of demonstrations which can be performed to illustrate the various types of jamming provided by the trainer. Table 4-1 also lists the procedure used in setting up the trainer for each demonstration, and the expected result on the radar scope target display. These demonstrations should continue until the students can distinguish between normal and jammed radar target displays.

TABLE 4-1. SUGGESTED PROCEDURES FOR TRAINING DEMONSTRATIONS

DEMONSTRATION NUMBER	TO DEMONSTRATE	PROCEDURE	RESULTS
1	Effect of cw interference.	With MODULATION SELECTOR switch at CW-EXT MOD, tune trainer to the radar set frequency.	The radar transmitter pulse, noise (grass), and the target echo will disappear if the strength of the interference signal is strong enough.
2	Effect of tuned and untuned cw signals.	Listening in on the headset, vary the trainer cw in and out of tune with student radar set by means of the RF FREQ control.	Interference appears only at synchronous frequencies. (On some radars, interference may appear at the image frequency).
3	Tracking through by lowering receiver sensitivity and gain of radar set.	Trainer tracks radar set. Student lowers receiver gain.	Depending on the relative power of the target echo and trainer signal, target echo may appear through interference.
4	Tracking through interference by varying frequency of radar set.	Trainer tracks radar set with fixed frequency cw. Student varies frequency of radar set.	Interference appears at synchronous frequency and disappears at any non-synchronous frequency.
5	CW interference in a swept frequency.	Trainer operates at swept frequency cw; radar set at fixed frequency.	Student observes periodic interference on radar set. Target echo may be lost.

TABLE 4-1. SUGGESTED PROCEDURES FOR TRAINING DEMONSTRATIONS (cont)

DEMONSTRATION NUMBER	TO DEMONSTRATE	PROCEDURE	RESULTS
6	Effect of sweep sector.	Adjust SWEEP SECTOR switch to 1100, 500, and 250 mc.	Trainer swept through full range will jam radar. At 500 mc or 250 mc sectors, swept cw may or may not jam radar, depending on the setting of RF FREQ control.
7	Effect of sweep rate.	Vary the SWEEP RATE control of the trainer.	Interference signal sweep rate will vary.
8	Interference by amplitude modulated signal.	Tune trainer to the radar. Turn MODULATION SELECTOR switch to AMPLITUDE.	The radar display portrays many superimposed sine waves, partially or completely obscuring target echo. (See figure 4-1(C, D)). At very high trainer modulation frequencies, the target echo may be completely lost.
9	Interference by square wave modulated signal.	Tune trainer to the radar. Turn MODULATION SELECTOR switch to SQUARE.	The radar display portrays many superimposed square waves, partially or completely obscuring target echo. (See figure 4-1(E, H)). Target echo may be completely lost.
10	Interference by pulse modulated signal.	Tune trainer to the radar. Turn MODULATION SELECTOR switch to PULSE.	The radar display portrays pulses partially or completely obscuring target echo. (See figure 4-1(G, H)). Target echo may be completely lost.
11	Interference by noise modulated signal.	Tune trainer to the radar. Turn MODULATION SELECTOR switch to NOISE.	The radar display portrays "grass", partially or completely obscuring target echo. (See figure 4-1(I)). Target echo may be completely lost.

#### 4-7. DRILLS AND PROBLEMS.

4-8. As described in Section II, the trainer can emit fixed or swept frequency jamming signals. The settings of the trainer controls for these modes of operation are shown in tables 4-2 and 4-3, respectively. Each of the jamming signal characteristics listed in these tables can be varied in sweep rate, sweep sector, percent modulation, etc, by setting the trainer controls to the settings indicated. If a control does not apply in obtaining certain signal characteristics, the table will indicate this by N/A (not applicable). Some characteristics can be varied to a great extent (especially those whose controls can be set to any and all positions) while others, such as fixed frequency cw unmodulated signals, or swept frequency signals (pulse-modulated at 50 or 100 kc), have relatively fixed characteristics.

4-9. Each of these conditions can be made increasingly more complex by varying the controls which

can be set to any and all positions. They can be varied from their extreme counterclockwise to their extreme clockwise positions, or any combination thereof, to achieve the required amount of complexity. After a trainer signal characteristic has been chosen, and the radar set jammed, the students must re-track the target, using one of the remedies listed in tables 4-2 and 4-3.

4-10. After the students have re-tracked the target, the instructor can make the trainer signal even more complex by increasing the sweep rate, or the modulation frequency, or the percentage of modulation, or any combination thereof, to jam the radar set once more. The students must then re-track the target. These drills should be made more and more complex for each type of signal characteristic, using the procedure discussed above. The drills should be continued until the students have become proficient in re-tracking the radar target.



TABLE 4-2. DRILLS AND PROCEDURES FOR FIXED FREQUENCY OPERATION

Jamming Signal Characteristics	*Trainer Control Settings					Remedies and Remarks
	MODULATION SELECTOR	MOD FREQ SEL	VAR FREQ	PERCENT MODULATION	Effect	
1. Fixed frequency cw unmodulated signal	CW-EXT MOD	N/A	N/A	N/A	See figure 4-1(B)	<p>Any or all of the following steps are to be taken in de-jamming a jammed radar set:</p> <p>a. Re-track target; b. Change radar frequency; c. Reduce radar receiver sensitivity.</p> <p>If any difficulty is encountered in the above steps, refer to the Instruction Manual pertaining to the radar set in use.</p> <p>*NOTES</p> <p>1. Set the FIXED-SWEPT FREQ switch to FIXED; 2. The PULSE WIDTH (USEC) control is only applicable to steps 8, 9, and 10; 3. The control settings can be set to simulate any desired signal characteristic or can be changed indiscriminately to produce various types of jamming signals; 4. N/A denotes not applicable.</p>
2. Fixed frequency signal amplitude modulated at 15 cps - 15 kc	AMPLITUDE	15 CPS-15KC	Set to any and all positions	Set to any and all positions	See figure 4-1(C, F)	
3. Fixed frequency signal amplitude modulated at 50 kc	AMPLITUDE	50 KC	N/A	Set to any and all positions	See figure 4-1(D)	
4. Fixed frequency signal amplitude modulated at 100 kc	AMPLITUDE	100 KC	N/A	Set to any and all positions	Similar to figure 4-1(D)	
5. Fixed frequency signal square wave modulated at 15 cps - 15 kc	SQUARE	15 CPS-15 KC	Set to any and all positions	N/A	See figure 4-1(E)	
6. Fixed frequency signal square wave modulated at 50 kc square wave	SQUARE	50 KC	N/A	N/A	See figure 4-1(H)	
7. Fixed frequency signal square wave modulated at 100 kc	SQUARE	100 KC	N/A	N/A	Similar to figure 4-1(H)	
8. Fixed frequency signal pulse modulated at 15 cps-15 kc	PULSE	15 CPS-15 KC	Set to any and all positions	N/A	See figure 4-1(G)	
9. Fixed frequency signal pulse modulated at 50kc	PULSE	50 KC	N/A	N/A	See figure 4-1(H)	
10. Fixed frequency signal pulse modulated at 100kc	PULSE	100 KC	N/A	N/A	Similar to figure 4-1(H)	
11. Fixed frequency signal noise modulated	NOISE	N/A	N/A	Set to any and all positions	See figure 4-1(I)	

TABLE 4-3. DRILLS AND PROCEDURES FOR SWEPT FREQUENCY OPERATION

Jamming Signal Characteristics	*Trainer Control Settings					†Effect	Remedies and Remarks
	MODULATION SELECTOR	MOD FREQ SEL	VAR FREQ	PERCENT MODULATION			
1. Swept frequency cw unmodulated signal	CW-EXT MOD	N/A	N/A	N/A	See figure 4-1(B)	Any or all of the following remedies are to be taken in de-jamming a jammed radar set:  a. Re-track target; b. Change radar frequency; c. Reduce radar sensitivity.	
2. Swept frequency signal amplitude modulated at 15 cps-15 kc	AMPLITUDE	15 CPS-15 KC	Set to any and all positions	Set to any and all positions	See figure 4-1(C, F)		
3. Swept frequency signal amplitude modulated at 50 kc	AMPLITUDE	50 KC	N/A	Set to any and all positions	See figure 4-1(D)		
4. Swept frequency signal amplitude modulated at 100 kc	AMPLITUDE	100 KC	N/A	Set to any and all positions	Similar to figure 4-1(D)	If any difficulty is encountered in the above steps, refer to the Instruction Manual pertaining to the radar set in use.	
5. Swept frequency signal square wave modulated at 15 cps-15 kc	SQUARE	15 CPS-15 KC	Set to any and all positions	N/A	See figure 4-1 (E)		
6. Swept frequency signal square wave modulated at 50 kc	SQUARE	50 KC	N/A	N/A	See figure 4-1(H)		
7. Swept frequency signal square wave modulated at 100 kc	SQUARE	100 KC	N/A	N/A	Similar to figure 4-1(H)	<b>*NOTES</b>  1. Set the FIXED-SWEPT FREQ switch to SWEPT FREQ; 2. Set SWEEP SECTOR (MC) switch to 250, 500, or 1100, as desired, and set SWEEP RATE (MC/SEC) control to any and all positions; 3. The PULSE WIDTH (USEC) control is only applicable to steps 8, 9, and 10. 4. N/A denotes not applicable. † See note 3 of figure 4-1.	
8. Swept frequency signal pulse modulated at 15 cps-15 kc	PULSE	15 CPS-15 KC	Set to any and all positions	N/A	See figure 4-1(G)		
9. Swept frequency signal pulse modulated at 50kc	PULSE	50 KC	N/A	N/A	See figure 4-1(H)		
10. Swept frequency signal pulse modulated at 100kc	PULSE	100 KC	N/A	N/A	Similar to figure 4-1(H)		
11. Swept frequency signal noise modulated	NOISE	N/A	N/A	Set to any and all positions	See figure 4-1(I)		



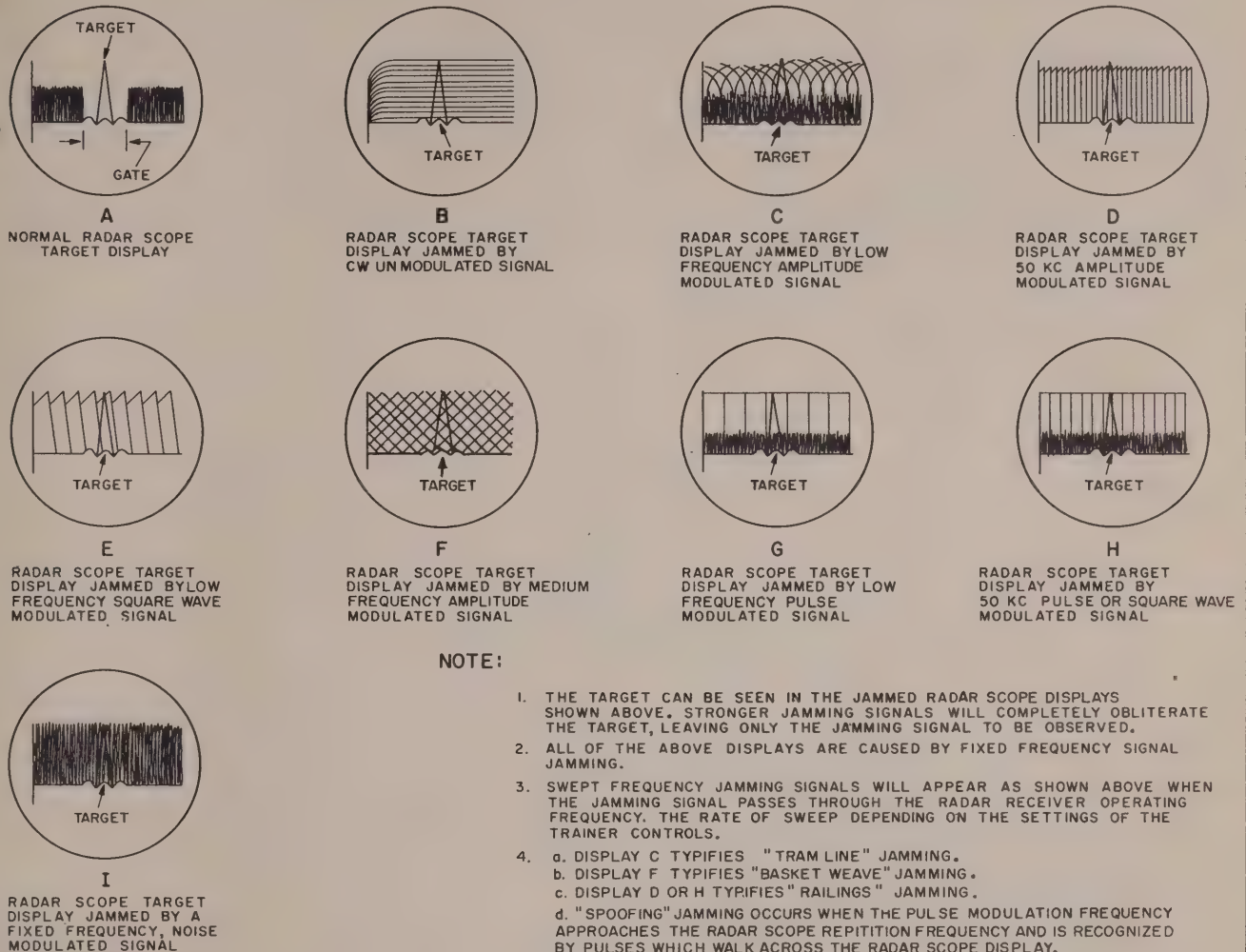


Figure 4-1. Normal and Jammed Radar Scope Target Displays

4-11. Figure 4-1 illustrates a normal radar target signal, and the effects of various jamming signal characteristics on a signal of this type. The displays shown in this figure are for fixed frequency jamming. Swept frequency jamming will look the same, as the swept signal frequency passes through the radar receiver frequency. The rate of sweep will depend on the setting of the trainer SWEEP RATE and SWEEP SECTOR control settings.

#### 4-12. POST-DEMONSTRATION ACTIVITIES.

4-13. It is important for the instructor to note that, although the student may observe the jamming displays on the repeaters, each student must receive instructions at the radar set proper. Doing so, will

give the student a better understanding of tracking-through techniques and a better "feel" for the radar set controls as used for dejamming purposes. Remember that repeater displays reduce the effectiveness of communications between the student and instructor, as well as the student's visibility of the radar set controls during operation.

4-14. It will be evident that high-frequency noise modulation has the greatest effect on the radar signal. Low frequency modulation rates are less effective. As the instructor follows the steps outlined in these tables, the drills should be made more and more complex. At each step, the instructor can vary the controls which change the trainer's signal characteristics. These controls may be set to any and all

settings. After the instructor has become familiar with the trainer and the particular radar set in use, he will come to know which position of the trainer controls are most effective.

4-15. Students should take notes during the instructor's lecture and demonstration. These notes should include the procedures used in each demonstration and their expected results. After class, the student can study these notes and thus increase his proficiency in anti-jamming techniques. This will also increase the value of each succeeding lesson and enable the student to derive as much benefit from the

lectures as possible in the least amount of time.

4-16. In addition to the question and answer period referred to in paragraph 4-1, the instructor should give tests to his students in the art of tracking-through, under jammed signal conditions. These tests should be based on classroom and field lectures and demonstrations. Tests should be designed to indicate the students' progress and ability to absorb the instructional material. A number of tests should be given from time to time so that the students' progress may be observed and weaknesses corrected before the course ends. See paragraph 8-1 for typical test forms.

## SECTION V

### INSTALLATION AND ADJUSTMENTS

#### 5-1. UNPACKING THE TRAINER.

5-2. In unpacking the Radar Signal Interference Trainer (X-Band) Device 15X12, try to preserve the original packing crate so that it may be re-used for repacking the equipment, if required. Observe the following precautions:

- a. Remove nails with a nail puller only.
- b. Remove screws with a screwdriver only.
- c. Do not hammer or pound on the packing crate.
- d. Keep all levers on crowbars away from the interior of the crate.

#### 5-3. INSTALLATION. (See figure 5-1.)

##### WARNING

High voltages, dangerous to life, are employed in the operation of this equipment. Observe all safety precautions. Do not operate the equipment unless it is completely enclosed in its dust cover.

5-4. The trainer is completely factory-adjusted and tested, and is ready for use when shipped.

5-5. There are no external adjustments to the trainer other than the operating controls described in Section II. Internal adjustments should be made only by qualified maintenance personnel, as described in paragraph 7-14.

5-6. To install the trainer for use, refer to the front panel and cabling diagrams, figures 2-1 and 10-1 respectively. Observe the following procedure:

a. Attach the female plug of the twenty-five foot input power cable W701 to the power input jack (15). Insert the male plug into a power source having an output of 105 to 120 volts, 50 to 440 cps, single phase.

b. Plug headset HT101 into the AUDIO jack (16).

c. By means of rf cable W601, attach the horn antenna to the RF OUTPUT connector (17).

d. Position the trainer so that straight line propagation from the trainer antenna to the student-operated radar set antenna, will be unobstructed. Place the trainer antenna in close proximity to the radar antenna.

e. Aim the trainer antenna in the direction of the student-operated radar set antenna. Proper placement of the trainer antenna is very important in effective jamming of the radar set. (Refer to paragraph 3-12.)

f. If external modulation is being used, plug the external modulation input into the EXT MOD jack (18).



## INSTALLATION STANDARDS

## DATA SHEET

Device Name: Radar Signal Interference  
Trainer (X-Band)

Device Number: 15X12

Classification: Unclassified

USE: Training in radar tracking under jammed signal conditions.

HOW TO OBTAIN: Address all requests to the Department of the Navy  
U. S. Naval Training Device Center  
Post Washington, New York

NECESSARY PROVISIONS

POWER: 105 to 120 volts ac, 50 to 440 cps, single phase, 500 watts.

SPACE REQUIREMENT: Minimum of 6 by 7 feet.

SPECIAL REQUIREMENTS: Illumination: Small light enabling operator to discern markings  
on front panel during possible night field demonstration.

MINIMUM OPENING TO  
PASS THROUGH: Before uncrating, will pass through an opening of 16 by 24 inches.

STUDENT CAPACITY: Limited to 3 students per radar set, plus 3 students at each  
display repeater used.

OPERATING PERSONNEL: One Instructor.

MAINTENANCE PERSONNEL: One.

## WEIGHTS AND DIMENSIONS OF COMPONENTS

ITEM	SIZE (inches) UNCRATED	SIZE (inches) CRATED	NET WEIGHT	CRATED WEIGHT
1. Device 15X12 Total-1 case	19-23/32 by 13-25/32 by 19-23/32	23-1/2 by 15-3/4 by 22	95 lbs	140 lbs

Figure 5-1. Data Sheet, Installation Standards (sheet 1 of 2)

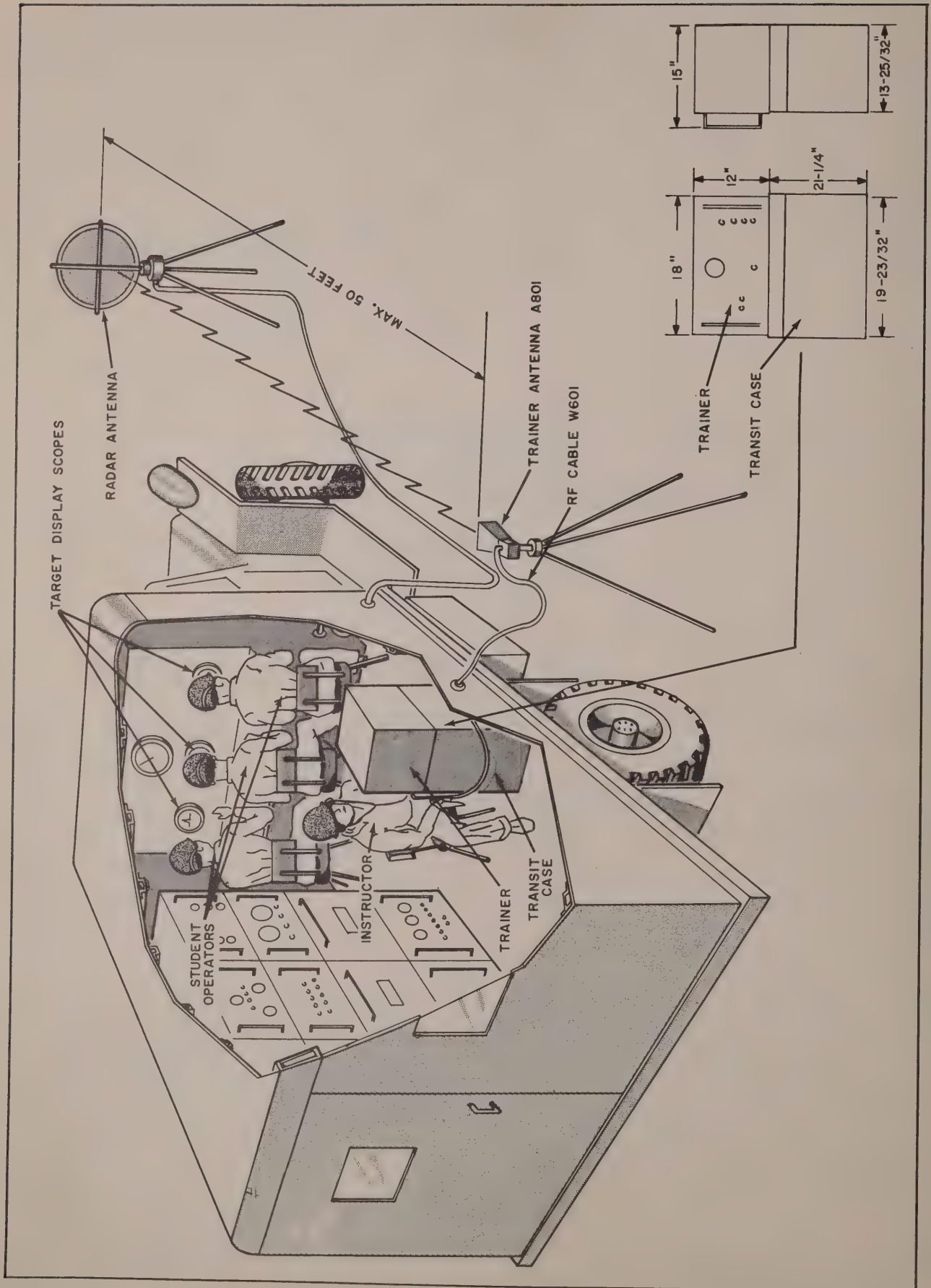


Figure 5-1. Typical Field Installation Standards (sheet 2 of 2)



## SECTION VI

## THEORY OF DEVICE OPERATION

**6-1. FUNCTIONAL OPERATION OF THE TRAINER.**  
(See figure 10-18.)

6-2. The trainer is a self-contained unit consisting of five major sections: an rf section, a modulator, a keyer, an audio amplifier, and a power supply. A description of each section follows:

a. The rf section consists of an internal cavity reflex klystron tube which generates the carrier wave (tunable through the X-Band), a waveguide which divides the rf output to the antenna and the audio amplifier, a synchronous diode, a power monitor meter, and a horn antenna.

b. The modulator section includes a sweeping circuit and four generators: sine-wave, square-wave, pulse, and noise. The signal from one of these generators or from an external modulation source is added to the carrier wave in the keyer when amplitude modulation is desired. The sweeping circuit supplies a triangular waveform for the klystron reflector (repeller) and tuner grid, to effect a swept frequency.

c. The keyer section adjusts the voltage of the modulator outputs to the proper level for the klystron. It consists of a keyer tube, summing amplifier, and modulation selector switch, in addition to its associated circuitry. The keyer tube operates only during square-wave or pulse modulation.

d. The audio amplifier amplifies the trainer and radar set signals to a level which can be heard in the headset. Maximum audio signal is heard when the trainer and radar set frequencies are synchronously tuned.

e. The power supply section supplies all circuits with a 6.3-volt filament voltage, and +300-volt dc and -300-volt dc regulated voltages from a 105-120-volt ac, 50-440 cps source.

**6-3. CIRCUIT ANALYSIS.** (See figure 10-19.)**6-4. RF SECTION.**

6-5. The trainer employs a type 2K45 thermally-tuned internal cavity reflex klystron as an oscillator. The klystron tube generates a cw signal in the frequency range 8500 mc to 9600 mc, which can be swept in sweep sector widths of 250, 500 or 1100 mc, if desired. This signal can be amplitude-modulated and tuned to the radar set radio frequency. (When using the 1100 mc sweep, the RF FREQ control must

be set at its midpoint so that the frequency limits of the X-Band are not exceeded. Should these limits be exceeded, the 2K45 klystron oscillator may become inoperative at the limits of the band.) Tuning and sweeping is achieved by the "warping" of the cavity grids, induced by the heating effect of a current passing through a section of the klystron connected as a triode.

6-6. The mechanical configuration of the klystron with its tuner device is given in figure 6-1.

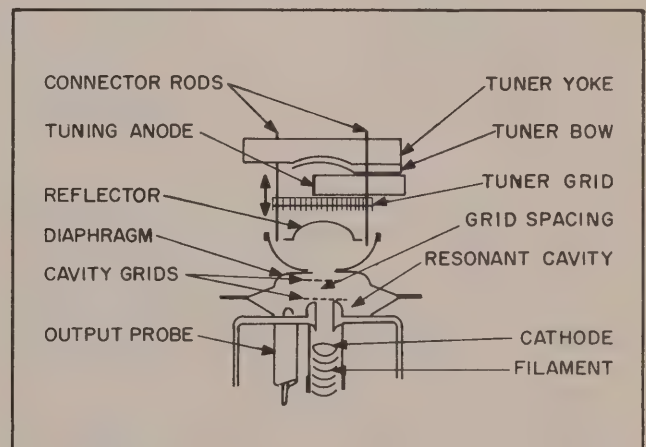


Figure 6-1. Reflex Klystron,  
Simplified Sectional View

a. The klystron is tuned by means of the tuning anode. Thermal expansion of the anode causes the tuner bow to move laterally, causing longitudinal movement of the tuner yoke, connector rods, diaphragm and cavity grids.

b. The klystron is swept by a back-and-forth motion of the tuning anode, caused by a triangular wave in the tuner grid. The sweep rate of the tube is limited by the rate the anode can be made to expand and contract.

c. The magnitude of the warping current is controlled by the tuner grid, connected to the sweeper and rf tuning circuits. Warping of the cavity grids will vary the effective capacitance of the resonating circuit, and thus effect a change in frequency. When the klystron operates at a modulated and/or swept frequency, the modulator waveform voltage is applied to the reflector, and the triangular sweeper voltage is applied to both the cavity and tuner grids.

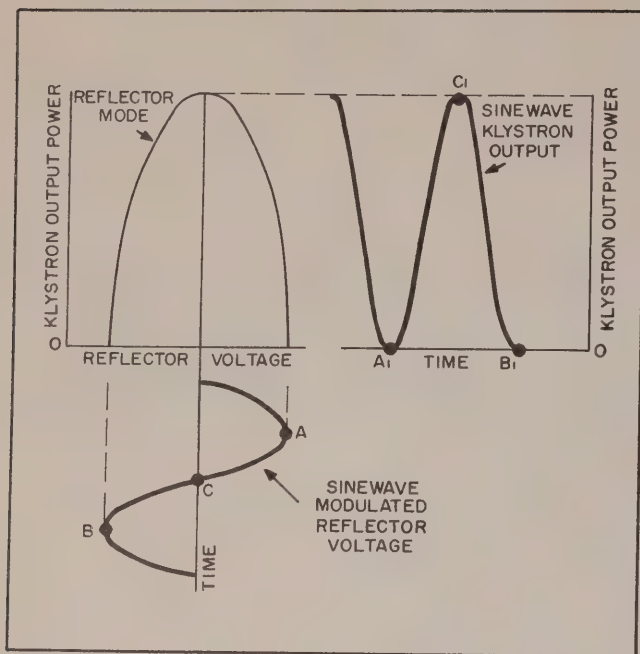


Figure 6-2. Reflector Mode, Sine-wave Modulation

6-7. To modulate the trainer carrier signal, the output from the sine wave, square wave, noise, or pulse generators (or an external source) is added to the reflector. The output of the klystron will vary with reflector voltage, and a modulating signal in the reflector voltage will produce modulation in the amplitude of the cw.

a. Figure 6-2 illustrates sine wave modulation of the klystron reflector mode. At instant A, reflector voltage is at a maximum within the reflector mode and klystron power output  $A_1$  is zero. At instant B, reflector voltage is at a minimum within the reflector mode and klystron power output  $B_1$  is zero. At instant C, reflector voltage is in the center of the reflector mode and klystron power output is at a maximum. For every sine wave cycle which modulates the reflector mode, two cycles appear at the klystron output. For this reason, the sine wave generator is designed to oscillate at one-half the MOD FREQ SEL front panel frequency designation, when the MODULATION SELECTOR is in the AMPLITUDE position.

b. Figure 6-3 illustrates pulse and square wave modulation of the klystron reflector mode. At instant A, reflector voltage is outside of the reflector mode and klystron power output  $A_1$  is zero. At instant B, reflector voltage is in the center of the mode and klystron power is at the maximum. Reflector modulation voltage is determined by the modulator and keyer.

c. The modulated rf output of the klystron is adapted to a waveguide and sent to the antenna. The

transmitter-receiver antenna is a pick-up horn in the shape of a rectangular, truncated pyramid, sealed to exclude dirt and moisture. It is coupled to the waveguide by means of coaxial rf cable W601.

6-8. Mixer CR501 is a 1N23 crystal which receives the radar set signal input and a portion of the klystron output from a loop inserted in the waveguide. This crystal is sensitive to synchronous frequencies. When the klystron output frequency is tuned to the input radar set frequency, maximum current passes through the audio amplifier, in turn producing maximum sound in the headset. Maximum synchronization thus produces maximum sound. Where the radar set signal is very strong, it may be heard in the headset when the trainer is de-tuned; however, maximum audio signal will still occur at the synchronous frequencies.

#### 6-9. MODULATOR SECTION.

6-10. INTRODUCTION. The sine wave generator (see figure 6-4) is a Wien-bridge type oscillator with selectable bridge circuit. The selectable bridge consists of resistance-capacitance networks, a thermistor RT237, a frequency selector switch S201, and a variable frequency control R230A-R230B. The oscillator consists primarily of tubes V206 and V207. Fundamentally, the circuit is a feedback amplifier with positive feedback for a frequency selected by the Wien-bridge network. It is an oscillator by virtue of the positive feedback loop. The following paragraphs describe the oscillator and Wien-bridge circuits.

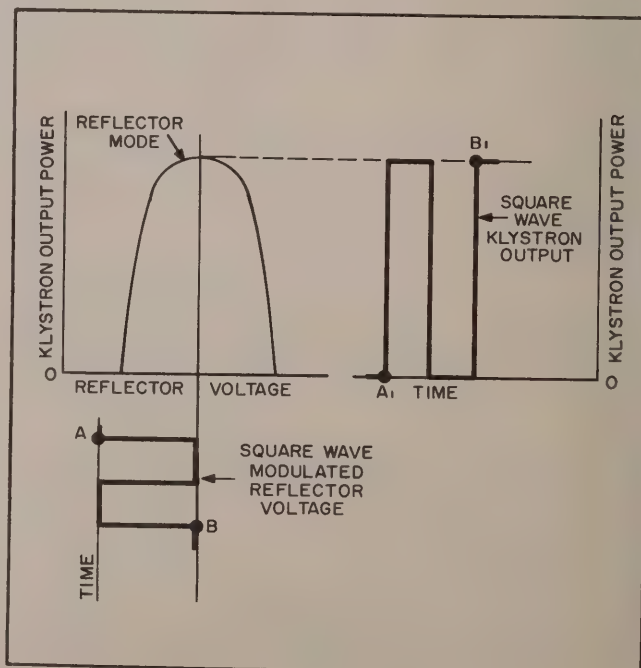


Figure 6-3. Reflector Mode, Pulse and Square-wave Modulation



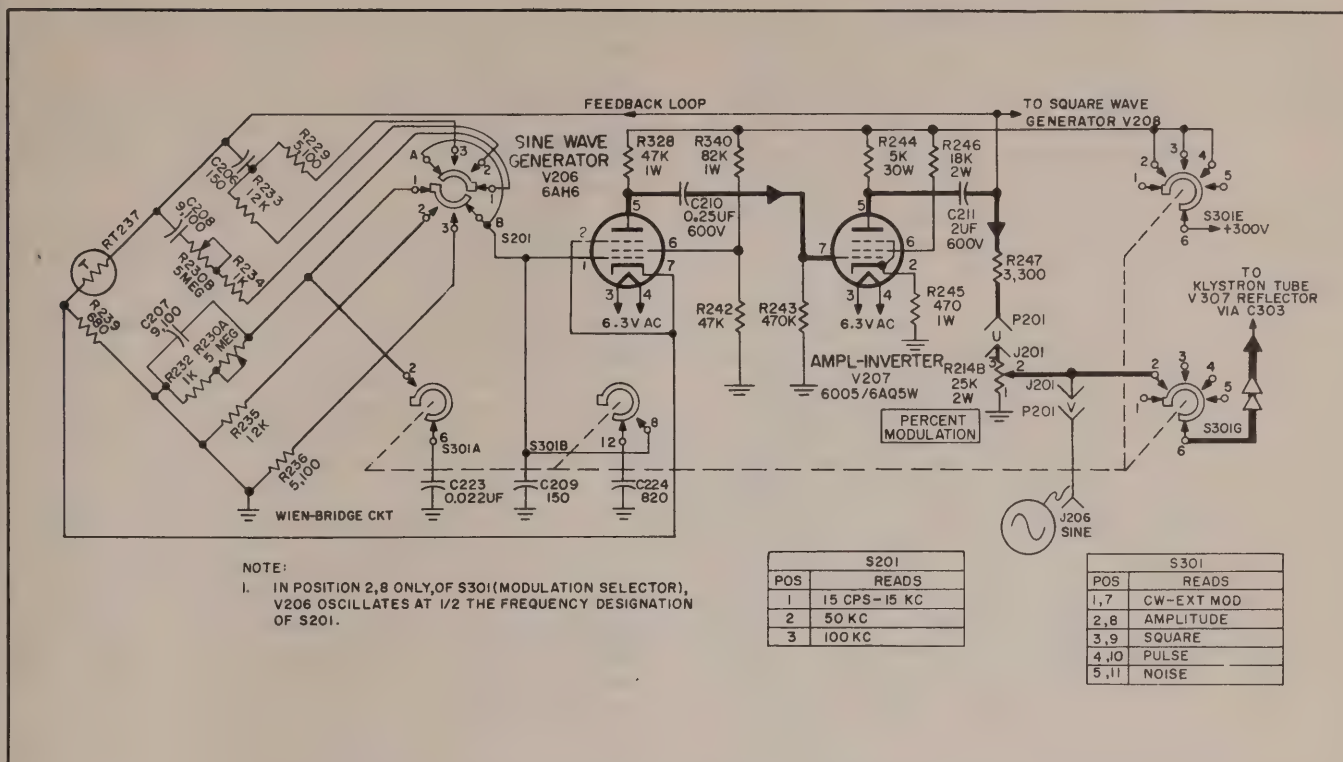


Figure 6-4. Sine-wave Generator, Simplified Schematic Diagram

**6-11. SINE-WAVE GENERATOR CIRCUIT.** Tube V206 is an oscillator tube. Tube V207 acts as an amplifier and inverter. Thus, without the bridge circuit, this system oscillates, since any signal that appears at the grid (pin 1) of V206 is amplified and inverted by both V206 and V207. The voltage feedback to the grid of V206, which reinforces the initial signal, causes oscillations to be set up and maintained. This system is capable of amplifying voltages over a very wide range of frequencies. Voltages of any frequency or of any combination of frequencies can cause oscillation. A bridge circuit is used to eliminate feedback voltages of all frequencies except the single desired frequency.

**6-12. WIEN-BRIDGE CIRCUIT.** The bridge circuit is used to eliminate all frequencies except the desired frequency. The Wien-bridge allows a voltage of only one frequency to be fed back from V207 to V206 because of degeneration and phase shift provided by the circuit. The fixed legs of the Wien-bridge consisting of thermistor RT237 and resistor R239 provide degenerative feedback. This feedback is practically constant for all frequencies. The variable legs of the Wien-bridge for 100 kc frequency, as shown in figure 6-4, consist of capacitors C206 and C209, and resistors R229 and R236. They provide positive (regenerative) feedback equal to the negative (degenerative) feedback only at the desired frequency. Thermistor RT237 is used to stabilize the amplitude of oscillation. If the amplitude of oscillation increases, the current through the thermistor will increase, and because of non-linearity, the resistance

of the thermistor will decrease. Therefore, the voltage drop across RT237 decreases, resulting in a greater degenerative potential at the cathode, pin 7, of V206. This action reduces the gain of V206, thereby holding the output voltage at a nearly constant amplitude. The values of the resistors in the variable legs of the Wien-bridge increase as the frequency decreases. For a frequency of 100 kc, as stated, the resistors in the variable legs are R229 and R236. Each has a resistance of 5100 ohms. For a frequency of 50 kc (half as great), the resistors in the variable legs are R233 and R235. Each has a resistance of 12,000 ohms (approximately twice the value of R229 and R236).

**NOTE**

In all positions of the MOD FREQ SEL switch and for the AMPLITUDE position only of the MODULATION SELECTOR switch, sine wave generator V206 oscillates at one-half the front panel MOD FREQ SEL frequency designations. (See figure 10-19.)

**6-13. OUTPUT SIGNAL.** The sine wave output at the selected frequency is available for display at test point jack J206. This output is fed directly to the square wave generator, and through a voltage dividing network, consisting of resistors R247 and R214B, to the AMPLITUDE position of MODULATION SELECTOR switch S301. The amplitude of the sine wave supplied to the MODULATION SELECTOR

switch can be adjusted by the PERCENT MODULATION control R214B. The sine wave generator operates in the AMPLITUDE, SQUARE, and PULSE positions of the MODULATION SELECTOR switch S301.

**6-14. SQUARE WAVE GENERATOR.** The square wave generator (see figure 6-5) is a bi-stable multivibrator, with coupled cathodes, that produces a square wave output from a sine wave trigger. The operation is as follows:

a. Condition one: section A of V208 conducts, causing the grid (pin 7) of section B to be at a large negative potential, cutting off section B. Condition two: V208B conducts, causing the cathode (pin 3) of V208A to be at a high potential, thereby cutting off V208A. The transition from one condition to the other is initiated by the sine wave. Assume V208B is conducting and section A is cut off. A positive-going sine wave will cause the voltage at the grid (pin 2) of V208A to rise above cutoff. As conduction begins, the negative-going voltage at the plate (pin 1) of V208A is fed to the grid (pin 7) of V208B. Due to the regenerative action of the cathode resistor R254, V208B is cut off, while tube V208A is conducting. As long as the sine wave remains above the

value required to make tube V208A conduct, a condition of stability will exist. When the sine wave goes into the negative half cycle, tube V208A is cut off. By similar coupling action, tube V208B is made to conduct. The circuit has now completed one cycle. Speed-up capacitor C213 is used to decrease the transition time.

b. The square wave generator operates only when the MODULATION SELECTOR switch S301 is in either the SQUARE or PULSE position. In this condition, the grid (pin 2) of V208A is at a potential of approximately +95 volts. This value permits V208A to conduct when triggered by a sine wave. When the modulation selector switch is in any other position, the plate (pin 1) of V208A is deprived of its B+ voltage, making V208A inoperative.

c. The square wave generator output is supplied through capacitor C214 to the pulse amplifier, and also through a network consisting of resistors R257, R256, and capacitor C220 to the SQUARE position of the MODULATION SELECTOR switch. Capacitor C220 acts as a d-c blocking and a-c coupling capacitor. Potentiometer R250 adjusts the symmetry of the square wave.

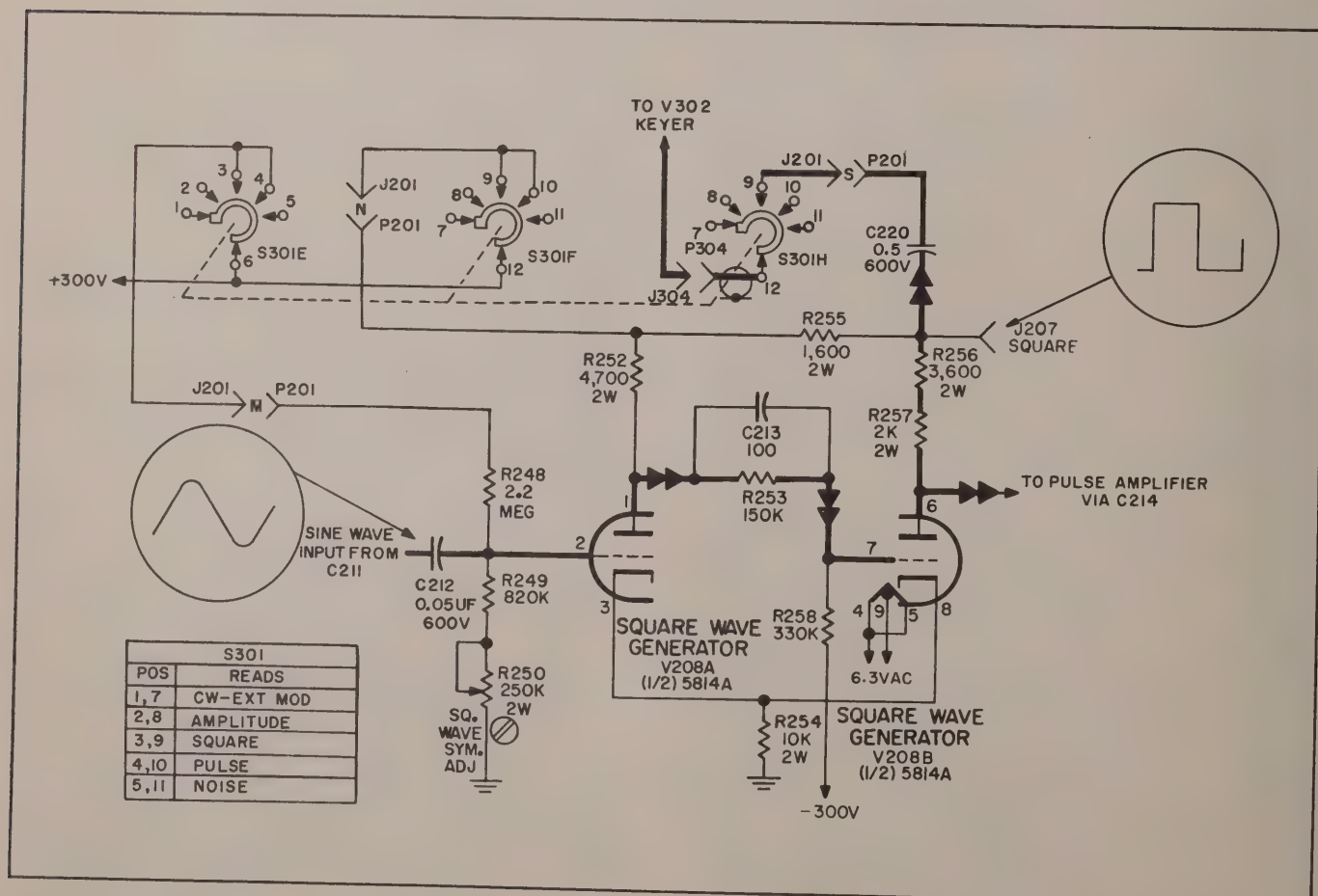


Figure 6-5. Square-wave Generator, Simplified Schematic Diagram



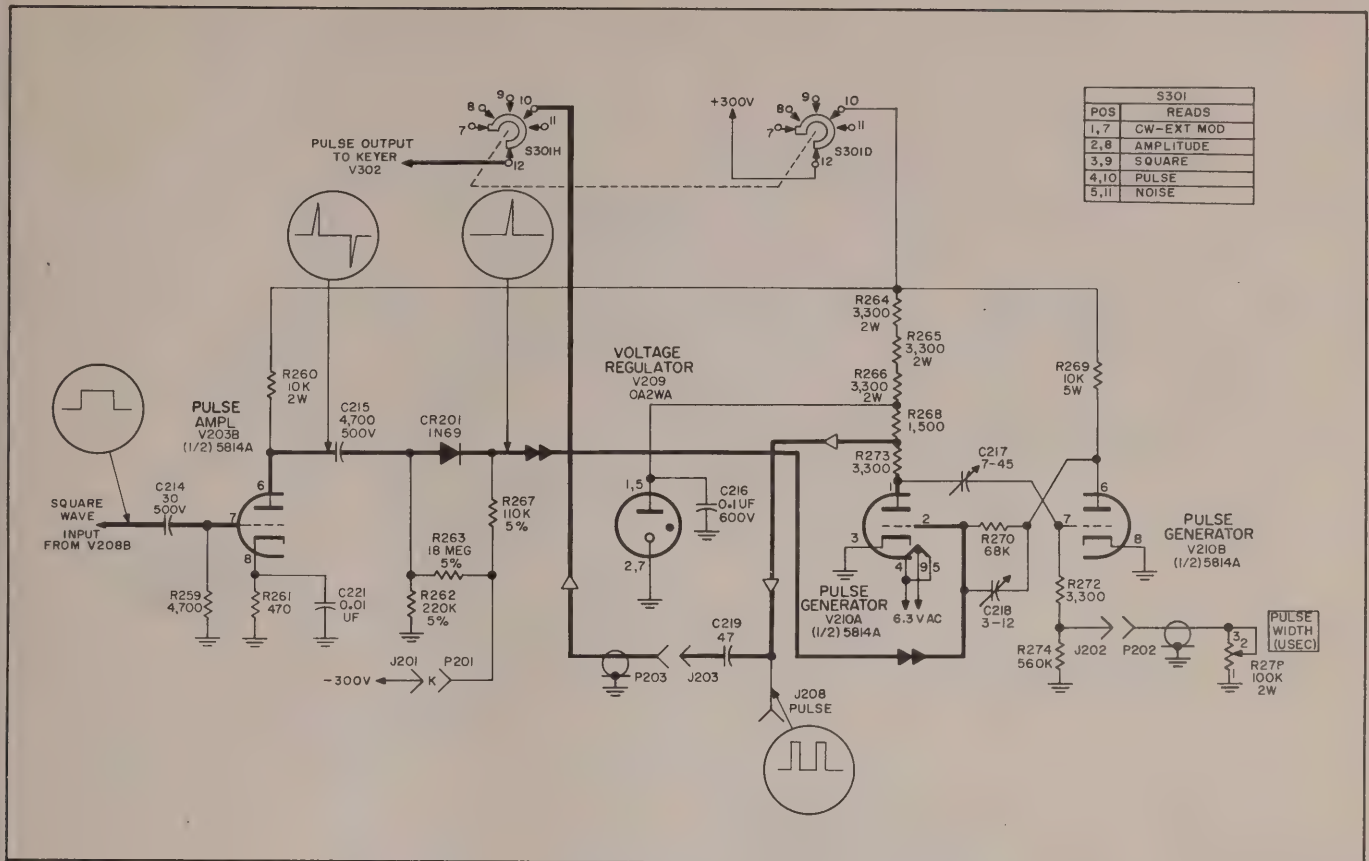


Figure 6-6. Pulse Generator Circuit, Simplified Schematic Diagram

**6-15. PULSE GENERATOR CIRCUIT.** The pulse generator circuit (see figure 6-6) produces a positive pulse, from one to five microseconds in duration, from a square wave input. The generator is comprised of a differentiating circuit, C214 and R259; a pulse amplifier V203B; crystal detector CR201; voltage regulator V209; pulse generator monostable multivibrator V210; and a pulse width adjust potentiometer R278. The circuit functions as follows:

a. The square wave output of pulse amplifier V208 is differentiated by capacitor C214 and resistor R259, resulting in positive and negative spikes which are applied to the grid of V203B. The signal is amplified and then clipped by crystal detector CR201. The output of the crystal is applied to the grid (pin 2) of monostable multivibrator V210. Resistor network R264, R265, R266, and voltage regulator V209 serve to supply and regulate a constant B+ of 150 volts to the plate (pin 1) of V210A.

b. A positive trigger is applied to the grid of V210A, causing this section to conduct and increasing the plate current flow. As current flows, the plate voltage drops. This negative-going voltage is applied to the grid of V210B, stopping conduction in this section. As the negative voltage starts to leak off, through R272, R278, and R274, the grid of V211B starts to swing positive, causing V210B to conduct. As V210B conducts, plate current flows, causing its

plate voltage to drop. This negative-going voltage is applied to the grid of V210A through R270 and C218, cutting off V210A. This condition exists until a positive trigger comes along, repeating the cycle once more.

c. The pulse output is available for display at J208 and is fed through coupling capacitor C219 to the PULSE position of MODULATION SELECTOR switch S301.

**6-16. NOISE GENERATOR CIRCUIT.** The noise generator circuit (see figure 6-7) generates a noise signal greater than 3 mc in bandwidth, and provides one stage of noise amplification. The circuit consists primarily of noise generator V201, a ring magnet mounted in a socket, noise amplifier V202, and one-half of a dual triode, V203A. The noise generator operates as follows:

a. A two-pole ring magnet surrounds V201, creating a magnetic field through the tube. The noise produced in the tube by gaseous conduction is amplified and extended in bandwidth by the action of the magnetic field, which alters the normal paths of conduction within the tube.

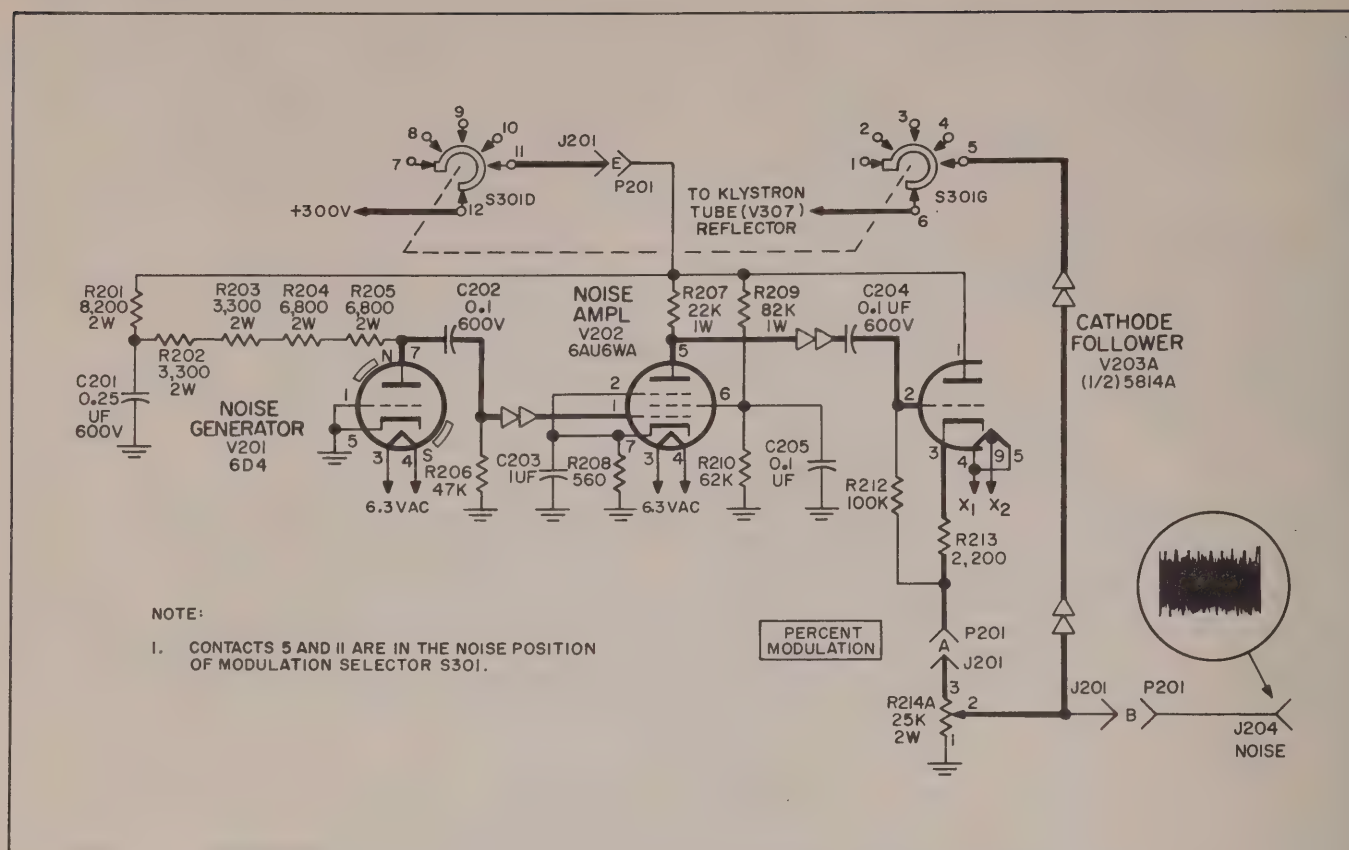


Figure 6-7. Noise Generator Circuit, Simplified Schematic Diagram

b. V202 amplifies the noise signal generated in V201. The output of the amplifier, at pin 5, is coupled to V203A, which acts as a cathode follower to provide a high input-low output impedance.

c. The noise signal output of the cathode follower is fed through PERCENT MODULATION control R214A directly to test jack J204 (provided for checking the waveform) and to the NOISE position of the MODULATION SELECTOR switch S301.

6-17. SWEEPER CIRCUIT. The sweeper circuit (see figure 10-19) provides a voltage of triangular waveform to the klystron tuner grid, which causes the klystron to be swept via the klystron tuning anode during SWEPT FREQ operation. The circuitry consists of relay switching tube V204; relay K201; miller integrator tube V205; cathode follower V211; and resistance networks, potentiometers, and switches. All of these serve to control the trainer sweep rate and other sweep section functions. Initially, relay switching tube V204 is cut off, and relay K201 feeds -300 volts dc to an RC network. This network consists of resistors (variable and fixed) and capacitors which are placed in or out of the circuit by rotary switch S302. These capacitors are charged, and the resultant exponential waveform appears across the grid and cathode of miller integrator V205. The integrator tube serves to improve the linearity of the exponential waveform which is then directly coupled

to cathode follower V211. The cathode follower output is fed to the summing amplifier (see paragraph 6-19) and is also fed back to relay switching tube V204, which was cut off. At this point, V204 begins to conduct, energizing relay K201. Relay K201 then feeds +300 volts dc to the RC network, reversing the cycle.

6-18. KEYER SECTION. (See figure 10-19.)

6-19. The keyer section serves to set the klystron tuner grid and reflector voltages at the proper voltage level for the trainer operating frequency and modes of operation. These are determined by the trainer operating control settings. For noise and sine wave modulation, the keyer biases the klystron output as shown in figure 6-2. For pulse and square wave modulation, the keyer biases the klystron output as shown in figure 6-3. During swept frequency operation, sweep inverter V301 receives a portion of the sweeper signal from the output of cathode follower V211 (see paragraph 6-17), through switch S303. This signal is then fed through the appropriate networks, depending on the position of SWEEP SECTOR switch S302, to cathode follower V304A. The swept frequency signal is then fed to summing amplifier tube V305, where the d-c level and the sweep are added. The d-c level is determined by the position of the RF FREQ (R315B), LO LIM SET (R353), and HI LIM SET (R335) control network. The summed



signal is then fed to cathode follower V303, which feeds it to the klystron reflector through a resistor-capacitor network consisting of R344, R342, C311 and C309, for AMPLITUDE and NOISE modulation. In the case of SQUARE or PULSE modulation, keyer V302 is activated. The keyer serves to shift the pulse or square-wave modulation reflector voltage so that its base line (time) appears just before the beginning of the reflector voltage (see figure 6-2). The reflector protective diode, V304B, prevents the reflector voltage from going positive (a condition which would ruin the klystron). Should the reflector voltage become positive, V304B conducts and acts as a short circuit, removing the positive voltage from the reflector. Voltage reference tube V306 is connected between the screen grid and cathode of the summing amplifier. Since summing amplifier V305 is essentially a d-c amplifier, small variations in screen grid voltage will cause undesirable large plate current variations. Tube V306 prevents this action by keeping the screen grid voltage on summing amplifier V305 constant. During fixed frequency operation, no swept frequency signal is available, and only steady d-c levels are applied to the tuner grid and the reflector. The d-c levels are determined by the setting of the RF FREQ control. The fixed frequency reflector d-c level and the sine wave, square wave, or pulse modulation signals are fed to the reflector through the same circuitry as described above, for keyer swept-frequency operation.

#### 6-20. AUDIO AMPLIFIER. (See figure 6-8.)

6-21. The audio amplifier amplifies the signal fed to it from CR501, a crystal detector in the klystron waveguide assembly. The amplifier consists of stages V101, V102, V103, and associated circuitry. A pulse stretcher circuit consisting of R108, CR101 and C108 is provided to increase the audibility of pulsed signals by return of the low frequency component afforded by the stretching of a pulse. The audio volume is controlled by R115, the AUDIO GAIN control, and the output is available at the AUDIO phone jack, J102.

#### 6-22. POWER SUPPLY. (See figure 10-19.)

6-23. The power supply supplies the modulator and transmitter sections with both +300 volt dc and -300 volt dc regulated voltages, from a 105-120V ac, 50-440 cps source. The supply consists of a three-position power switch, three voltage rectifier tubes, two power transformers, and two voltage regulating circuits hooked up in a normal voltage-regulated power supply circuit.

6-24. The filament voltages for all tubes are supplied by the filament windings on power transformers T401 and T402.

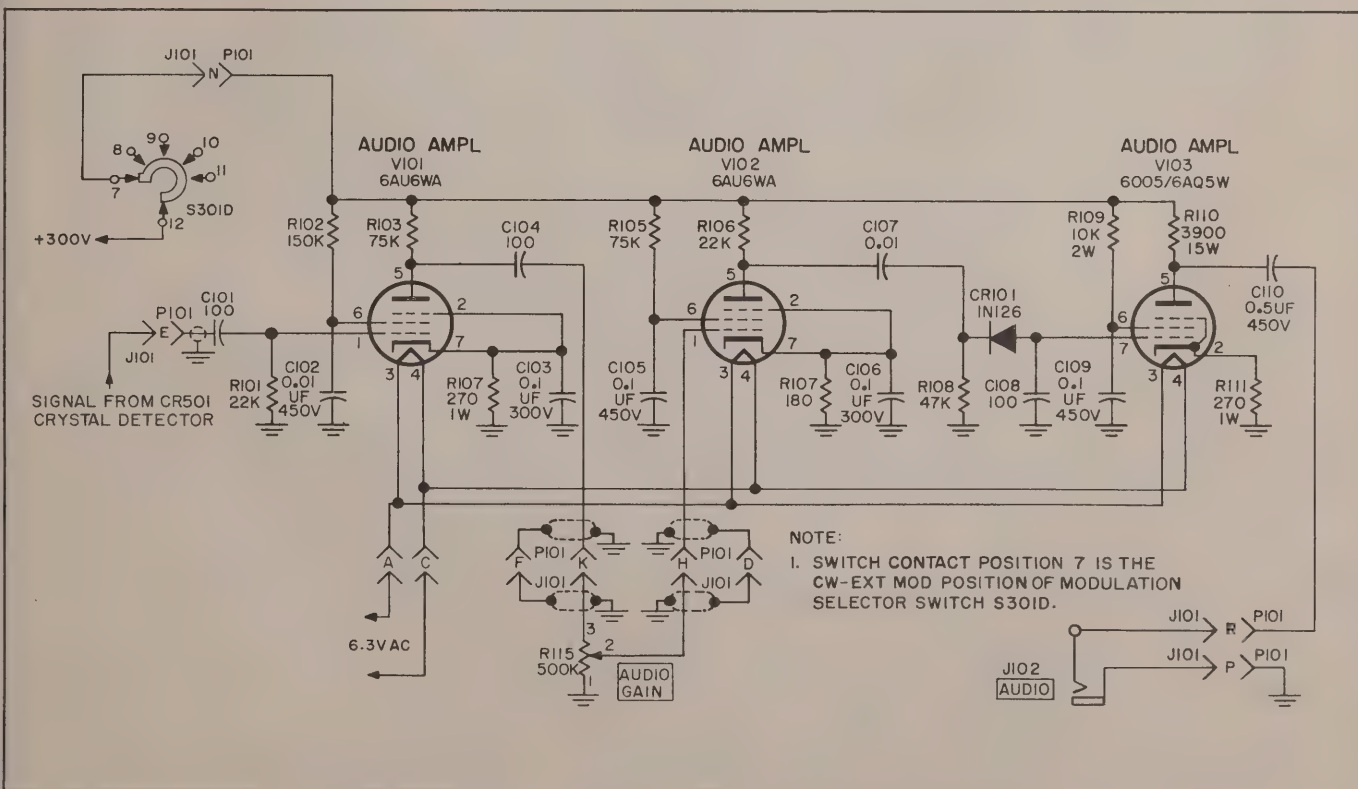


Figure 6-8. Audio Amplifier Circuit, Simplified Schematic Diagram

## SECTION VII

### MAINTENANCE

#### 7-1. GENERAL.

**7-2. EQUIPMENT FAILURE.** To insure continuous satisfactory operation of the Radar Signal Interference Trainer, the preventive maintenance and cleaning procedures outlined in paragraph 7-4 must be performed. In the event of equipment breakdown during operation, corrective maintenance procedures given in paragraph 7-11 will facilitate trainer repair. Keep an accurate log in which all failures, modifications, and observations concerning the equipment are entered. This log will serve as a valuable source of operational and maintenance information.

#### NOTE

All failures of this equipment which are not easily corrected should be promptly reported by filling out Electronic Failure Report (Form DD 787), and sending this report to the Commanding Officer, U. S. Naval Training Device Center, Port Washington, Long Island, New York.

**7-3. TEST EQUIPMENT REQUIRED.** The following test equipment is required for use in trouble-shooting procedures:

- a. Tektronix 514D oscilloscope, or an equivalent oscilloscope with a vertical bandwidth greater than 15 mc.
- b. Multimeter AN/PSM-4.
- c. Wavemeter - Frequency Meter FR-19(XW)/U.
- d. VTVM - Electronic Multimeter TS-505/U.
- e. Phase Shifting Network - Polarad Electronics Model No. MK-1 (figure 7-9) or equivalent.
- f. Tube Tester, Mutual Conductance Type - Hickok TV-3B/U or equivalent.

#### 7-4. PREVENTIVE MAINTENANCE.

**7-5.** Perform the periodic checks given in table 7-1 carefully in order to assure continuous satisfactory operation, and to maintain the trainer at peak operating efficiency. In addition, keep the trainer clean and free of dirt at all times.

TABLE 7-1. PREVENTIVE MAINTENANCE CHECK

WHAT TO CHECK	POSSIBLE DEFECT	REMEDY
Front Panel	Visually inspect front panel for dirt and corrosion, broken or loose switches, knobs and loose or missing screws.	Clean and repair all defective, dirty or deteriorated components. Tighten all screws. Use procedures outlined in paragraphs 7-4 through 7-8.
All Cables	Visually check for frayed or loose ends and signs of deterioration. Check all wiring connections.	Replace all defective or frayed wiring. Resolder loose connections.
Interior of Trainer	Visually check for loose connections, corrosion or deterioration.	Repair loose connections and replace corroded or deteriorated parts.
Power Supply Voltages	Defective component in power supply or misadjustment of power supply controls.	Locate, repair and replace defective components, using table 7-3 as an aid in trouble-shooting power supply. Reset power supply adjustments as instructed in table 7-4.
Resistors	Resistors may be cracked, charred or discolored.	Replace any resistors displaying a defect.
Capacitors	Capacitors may be bulging, leaking or have loose leads.	Replace any capacitors displaying a defect.
Electron Tubes	Visually check electron tubes for open filaments, cracked or loose envelopes, cracked bases.	Replace any electron tube displaying a defect.



**WARNING**

Turn all power off to allow all electron tubes to cool, before starting maintenance procedures. Observe special caution when in the vicinity of the klystron tube. Very high temperatures exist in this area.

7-6. Should the painted finish on the panel or covers become badly scarred or damaged, corrosion may be prevented by touching up the bared spots with the proper paint. Use a No. 00 or No. 000 sandpaper to clean the surface down to the bare metal and obtain a bright smooth finish, prior to using touch-up paint. The following items should be on hand for routine cleaning of the equipment:

- a. Brush, soft hair, paint type.
- b. Cloth, lint free.
- c. Sandpaper, No. 0000.
- d. Solvent, dry cleaning type.
- e. Benzene.
- f. Pliers, long nose and side cutters.
- g. Screwdriver.
- h. Soldering iron.
- i. Solder.

**CAUTION**

Never use steel wool to clean the equipment. Minute particles may enter the equipment and cause shorting of circuits.

**7-7. CLEANING THE TRAINER.**

7-8. The equipment can easily be cleaned without disassembling. Wipe all dust from between parts with a dry cloth. Use a dry brush to remove dust

from terminal strips, switches and wiring. Never use a damp or wet cloth to clean wiring. If dirt or corrosion exist which cannot be removed with a dry cloth or brush, use a cloth slightly moistened with a cleaning solvent, then wipe thoroughly dry. Do not, however, use a solvent on electrical contacts. These should be cleaned with benzene and then wiped dry with a clean cloth. For dirt and corrosion that cannot be removed with solvent, use a No. 0000 sandpaper. After sandpapering, reclean with solvent and wipe dry.

**7-9. LUBRICATION.**

7-10. Radar Signal Interference Trainer Device 15X12 requires no lubrication.

**7-11. CORRECTIVE MAINTENANCE.**

7-12. The corrective maintenance procedures outlined in table 7-2 are designed to isolate and localize any troubles that may occur within the trainer. Many failures of the equipment may be traced to relatively simple causes such as a broken wire, poor connections, defective tube, or blown fuse. Make all checks systematically. Haphazard checking wastes time and causes further trouble. The test equipment required to perform the trouble-shooting tests is listed in paragraph 7-3.

**WARNING**

This equipment employs voltages which are dangerous if contacted by operating personnel. Caution must be exercised when working with this equipment. Turn all power off for three minutes, before starting maintenance procedures.

**TABLE 7-2. TROUBLE-SHOOTING CHART**

STEP	SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
1	Power switch in STAND BY position but amber lamp does not glow.	<ol style="list-style-type: none"> <li>a. Failure of external power source.</li> <li>b. Fuse burned out.</li> <li>c. Defective lamp DS402.</li> <li>d. Transformer T402 defective.</li> <li>e. Defective switch S401.</li> <li>f. Defective power cable or connector J403, P403, J406.</li> </ol>	<ol style="list-style-type: none"> <li>a. Check external power source for failure.</li> <li>b. Determine cause of blown fuse; correct, and replace fuse.</li> <li>c. Replace lamp.</li> <li>d. Replace transformer.</li> <li>e. Replace switch.</li> <li>f. Replace defective component.</li> </ol>

TABLE 7-2. TROUBLE-SHOOTING CHART (cont)

STEP	SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
2	Power switch S401 in TRANSMIT position; red lamp does not glow, but amber lamp in step 1 above, does.	a. Defective lamp DS401. b. Transformer T401 defective. c. Defective connector J403, P403.	a. Replace lamp. b. Replace transformer. c. Replace connector.
3	With power switch in TRANSMIT position, meter M301 does not register in any position of the MODULATION SELECTOR switch.  (In PULSE position, meter M301 normally does not register.)	a. Defective crystal CR501. b. Defective power supply. c. Reflector not tracked. d. Defective klystron V307. e. Defective switch S301. f. Defective meter M301.	a. Replace crystal. b. Check all power supply voltage tubes, and components. See table 7-3 and figure 10-19. Locate defective part and replace. c. Adjust tracking per paragraph 7-20. d. Replace klystron. e. Replace switch. f. Replace meter.
4	In the NOISE position only of the MODULATION SELECTOR, for all positions of PERCENT MODULATION control, meter M301 reads the same as in CW-EXT MOD position.	a. Loss of noise modulation. b. Defective contact on MODULATION SELECTOR switch S301, NOISE position.	a. Check V201, V202, and V203. Check waveform at J204 against figure 7-1. b. Replace or repair switch.
5	In the AMPLITUDE position of the MODULATION SELECTOR, at all positions of PERCENT MODULATION control, meter M301 reads the same as in CW-EXT MOD position.  In this case, the SQUARE and PULSE positions of the MODULATION SELECTOR would also indicate abnormal readings.	a. Loss of sine wave modulation. b. Defective contact on MODULATION SELECTOR switch S301, AMPLITUDE position.	a. Check V206 and V207. Check waveform at J206 against figure 7-2. b. Replace or repair switch.
6	In the SQUARE position only of the MODULATION SELECTOR switch, meter M301 does not register but operated properly in step 5.	a. Loss of square wave modulation. b. Keyer section inoperative. c. Defective contact on MODULATION SELECTOR switch S301, SQUARE position.	a. Check V208. Check waveform at J207 against figure 7-3. b. Locate, repair or replace defective component. c. Replace or repair switch.



TABLE 7-2. TROUBLE-SHOOTING CHART (cont)

STEP	SYMPTOM	PROBABLE CAUSE	POSSIBLE REMEDY
7	In the PULSE position only of the MODULATION SELECTOR switch, meter M301 indicates a very small amount or 0.	a. This is normal.	a. See paragraph 2-8.
8	In the PULSE position only of the MODULATION SELECTOR switch, meter M301 gives 0 indication, but no pulses appear on the radar set. Trainer operates satisfactorily in steps 5 and 6.	a. Loss of pulse modulation. b. Defective contact on MODULATION SELECTOR switch S301, PULSE position.	a. Check V203, V209 and V210. Check waveform at J208 against figure 7-4. b. Replace or repair switch.
9	In the CW-EXT MOD position of the MODULATION SELECTOR switch, using external modulation, meter M301 registers the same as without external modulation.	a. Loss of external modulation. b. Defective EXT MOD connector. c. Defective external modulation connecting cable.	Check external modulation source. b. Check and replace defective connector. c. Replace defective cable.
10	No signal heard in headset; trainer and radar set synchronously tuned; meter M301 registering.	a. Defective V101, V102, or V103; or associated component. b. Defective AUDIO connector. c. Defective headset. d. Defective connector J101, P101.	a. Check and replace defective tube or component. b. Replace connector. c. Replace headset. d. Replace defective connector.
11	Signal heard in headset and M301 does not register; trainer known to be operating due to observation of radar display.	a. Defective meter M301. b. Defective resistor R399.	a. Replace meter. b. Replace resistor.

7-13. TROUBLE-SHOOTING. Certain steps of table 7-2 call for checking tubes or signal waveforms. First check the tubes with a mutual conductance tube tester and replace as required. If the tube is satisfactory, check the circuit voltage and resistance values, as given in table 7-3. Replace faulty components as required. To view the waveform connect an oscilloscope to the test jack and ground. See figures 7-1 through 7-4 for waveshapes and figure 10-19 for the overall schematic diagram.

## NOTES

All measurements in table 7-3 shall be made under the following conditions:

1. Line voltage set to 115 volts, 60 cycles.

2. Use Electronic Multimeter TS-505/U.
3. All measurements from pin to ground, unless otherwise indicated.
4. All voltage measurements dc, unless otherwise indicated.
5. Power switch in TRANSMIT position.
6. PERCENT MODULATION and AUDIO GAIN controls set to maximum clockwise position.
7. RF FREQ control set to 100.
8. MOD FREQ SEL switch set to 15 CPS-15 KC; VAR FREQ control to 200 CPS.
9. FIXED-SWEPT FREQ switch in FIXED position except those marked with an asterisk (\*).
10. \*These voltages will vary when the FIXED-SWEPT FREQ switch is in the SWEPT FREQ position.
11. \*\*MODULATION SELECTOR switch set at position indicated in this column.

TABLE 7-3. VOLTAGE AND RESISTANCE MEASUREMENTS

REFERENCE SYMBOL NUMBER	TUBE TYPE	PIN	VOLTAGE	RESISTANCE (OHMS)	**TYPE OF MODULATION
V101	6AU6WA	1 2 3 to 4 5 6 7	0 1.25 6.3AC 47 90 1.25	22K 270 0 INFINITY INFINITY 270	CW
V102	6AU6WA	1 2 3 to 4 5 6 7	0 1.45 6.3AC 155 120 1.45	500K 180 0 INFINITY INFINITY 180	CW
V103	6005/6AQ5W	1,7 2 3 to 4 5 6	0 11 6.3AC 142 250	1.6MEG 270 0 INFINITY INFINITY	CW
V201	6D4	1 3 to 4 5 7	0 6.3AC 0 18	0 0 0 175K	NOISE
V202	6AU6WA	1 2 3 to 4 5 6 7	-0.8 1.75 6.3AC 260 0 0	48K 570 0 170K 64K 570	NOISE
V203	5814A	1 2 3 4,5 to 9 6 7 8	300 95 125 6.3AC -145 0 0	145K 125K 28K 0 175K 4.7K 480	NOISE
V204	12AT7WA	1 2 3 4,5 to 9 6 7 8	*0 -140 0 6.3AC *0 -140 0	10.5K 220K 0 0 0 10.5K 220K 0	PULSE
V205	6AU6WA	1 2 3 to 4 5 6 7	-60 0 6.3AC *-24 0 0	10MEG 0 0 0 540K 29K 0	PULSE



TABLE 7-3. VOLTAGE AND RESISTANCE MEASUREMENTS (cont)

REFERENCE SYMBOL NUMBER	TUBE TYPE	PIN	VOLTAGE	RESISTANCE (OHMS)	**TYPE OF MODULATION
V206	6AH6	1 2 3 to 4 5 6 7	0 1.5 6.3AC 215 100 1.5	87K 700 0 97K 36K 700	PULSE
V207	6005/6AQ5W	2 3 to 4 5 6 7	15 6.3AC 150 230 0	470 0 130K 140K 470K	PULSE
V208	5814A	1 2 3 4, 5 to 9 6 7 8	270 87 110 6.3AC 270 90 110	50K 680K 11K 0 54K 135K 11K	PULSE
V209	OA2WA	1, 5 2, 7	150 0	180K 0	PULSE
V210	5814A	1 2 3 4, 5 to 9 6 7 8	108 -26 0 6.3AC 175 -4.6 0	220K 120K 0 0 190K 22K 0	PULSE
V211	6100/6C4WA	1 3 to 4 5 6 7	-125 6.3AC -125 *-140 *-140	100K 0 100K 650K 150K	PULSE
V301	6100/6C4WA	3 to 4 5 6 7	6.3AC *75 *-220 *-210	0 230K 230K 90K	PULSE
V302	6AU6WA	1 2 3 to 4 5 6 7	-300 -300 6.3AC -130 -205 -300	1. 15MEG 23K 0 1. 15MEG 30K 23K	PULSE
V303	6100/6C4WA	1, 5 3 to 4 6 7	300 6.3AC -110 -95	50K 0 155K 1. 15MEG	PULSE

TABLE 7-3. VOLTAGE AND RESISTANCE MEASUREMENTS (cont)

REFERENCE SYMBOL NUMBER	TUBE TYPE	PIN	VOLTAGE	RESISTANCE (OHMS)	**TYPE OF MODULATION
V304	12AT7WA	1 2 3 4, 5 to 9 6 7 8	300 0 4.5 6.3AC 90 -90 0	80K 22K 190K 0 900K 900K 0	PULSE
V305	6AU6WA	1 2 3 to 4 5 6 7	-200 -195 6.3AC -110 -110 195	110 40K 0 150K 150K 33K	PULSE
V306	6100/6C4WA	1, 5 3 to 4 6 7	0 6.3AC -200 -195	0 0 75K 32K	PULSE
V307	2K45	1 2 3 5 6 to 7 8	-3 3.6 -180 0 6.3AC -3	950K 750 1 MEG 0 0 950K	PULSE
V401	5R4WGA	2 4 6 8	520 - - 520	85K 30 38 85K	PULSE
V402	6080WA	1 2 3 4 5 6 7 to 8	185 520 300 185 520 300 6.3AC	1.6MEG 85K 46K 1.65MEG 85K 47K 0	PULSE
V403	5751	1 2 3 4, 5 to 9 6 7 8	50 0 0 6.3AC 175 42 50	370K 270K 0 0 1.65MEG 180K 370K	PULSE
V404	6X4W	1 3 to 4 6 7	-300 6.3AC -300 230	22K 0 22K 100K	PULSE
V405	6X4W	1 3 to 4 6 7	-300 6.3AC -300 230	22K 0 22K 100K	PULSE



TABLE 7-3. VOLTAGE AND RESISTANCE MEASUREMENTS (cont)

REFERENCE SYMBOL NUMBER	TUBE TYPE	PIN	VOLTAGE	RESISTANCE (OHMS)	**TYPE OF MODULATION
V406	6L6WGB	2 to 7	6.3AC	0	PULSE
		3	230	25K	
		4	285	17K	
		5	-24	1.1MEG	
		6	300	46K	
		8	0	0	
V407	5751	1	-115	170K	PULSE
		2	-195	250K	
		3	-215	106K	
		4, 5 to 9	6.3AC	0	
		6	-24	1.1MEG	
		7	-107	400K	
V408	5651	1, 5	-215	106K	PULSE
		2, 7	-300	22K	
V410	6080WA	1	175	1.65MEG	PULSE
		2	520	85K	
		3	300	46K	
		4	175	1.65MEG	
		5	520	85K	
		6	350	46K	
		7 to 8	6.3AC	0	

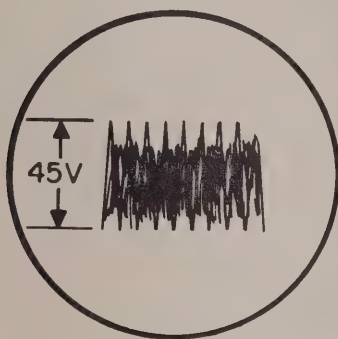


Figure 7-1. Noise Modulation Waveform at J204

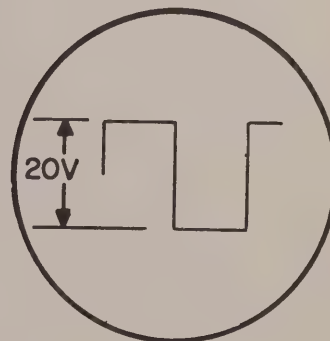


Figure 7-3. Square-wave Modulation Waveform at J207

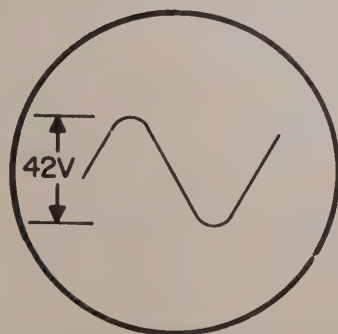


Figure 7-2. Amplitude Modulation Waveform at J206

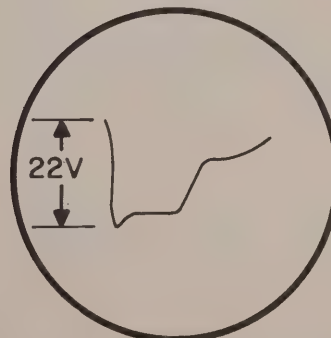


Figure 7-4. Pulse Modulation Waveform at J208

#### 7-14. INTERNAL ADJUSTMENTS

7-15. While great care has been taken in the design and manufacture of the trainer, aging or replacement of components will require re-setting of the internal adjustments. All internal adjustments have been factory-set and sealed with a semi-permanent seal to prevent undesired loosening. Since all adjustments affect the klystron tuning and sweeping circuits, unnecessary adjustments should not be made.

##### NOTE

The need for readjustment of the internal adjustments will be indicated by a difficulty in tuning the trainer through the X-Band (8500 to 9600 mc) in either the fixed or swept frequency mode of operation. Readjustment is also indicated if the RF FREQ control, when set to 50, does not fix the trainer operating frequency at the middle of the X-Band (approximately 9000 mc).

7-16. The trainer utilizes two d-c voltage-regulated power supplies (+300 and -300 volts), each of which may require adjustment. These adjustments are made by varying potentiometers R414 and R428, respectively (see figure 7-5). Set power switch S401 to the TRANSMIT position. Set MODULATION SELECTOR and FIXED-SWEPT FREQ switches to PULSE and SWEPT FREQ position, respectively. Adjust potentiometers R428 and R414, using the procedure listed in table 7-4. Since the -300 volt supply is used as a reference for the +300 volt supply, R428 must be adjusted before R414.

##### NOTE

Accurate settings of the power supply voltages are extremely important in maintaining the proper calibration of the RF FREQ control. An inaccurately adjusted power supply will change the operating frequency of the trainer.

##### WARNING

Exercise extreme caution when connecting meter test prods to J401 or J402. Use insulated test prods only. Voltages dangerous to life exist at these points.

TABLE 7-4. POWER SUPPLY ADJUSTMENTS

STEP	ADJUSTMENT	EQUIPMENT REQUIRED	SETTING
1	R428	Multimeter AN/PSM-4, set to 1000 volts dc range.	Connect negative test prod to J402 and positive test prod to ground (chassis). Adjust and lock R428 to read 300 volts dc on the meter.
2	R414	Multimeter AN/PSM-4, set to 1000 volts dc range.	Connect positive test prod to J401 and negative test prod to ground (chassis). Adjust and lock R414 to read 300 volts dc on the meter.



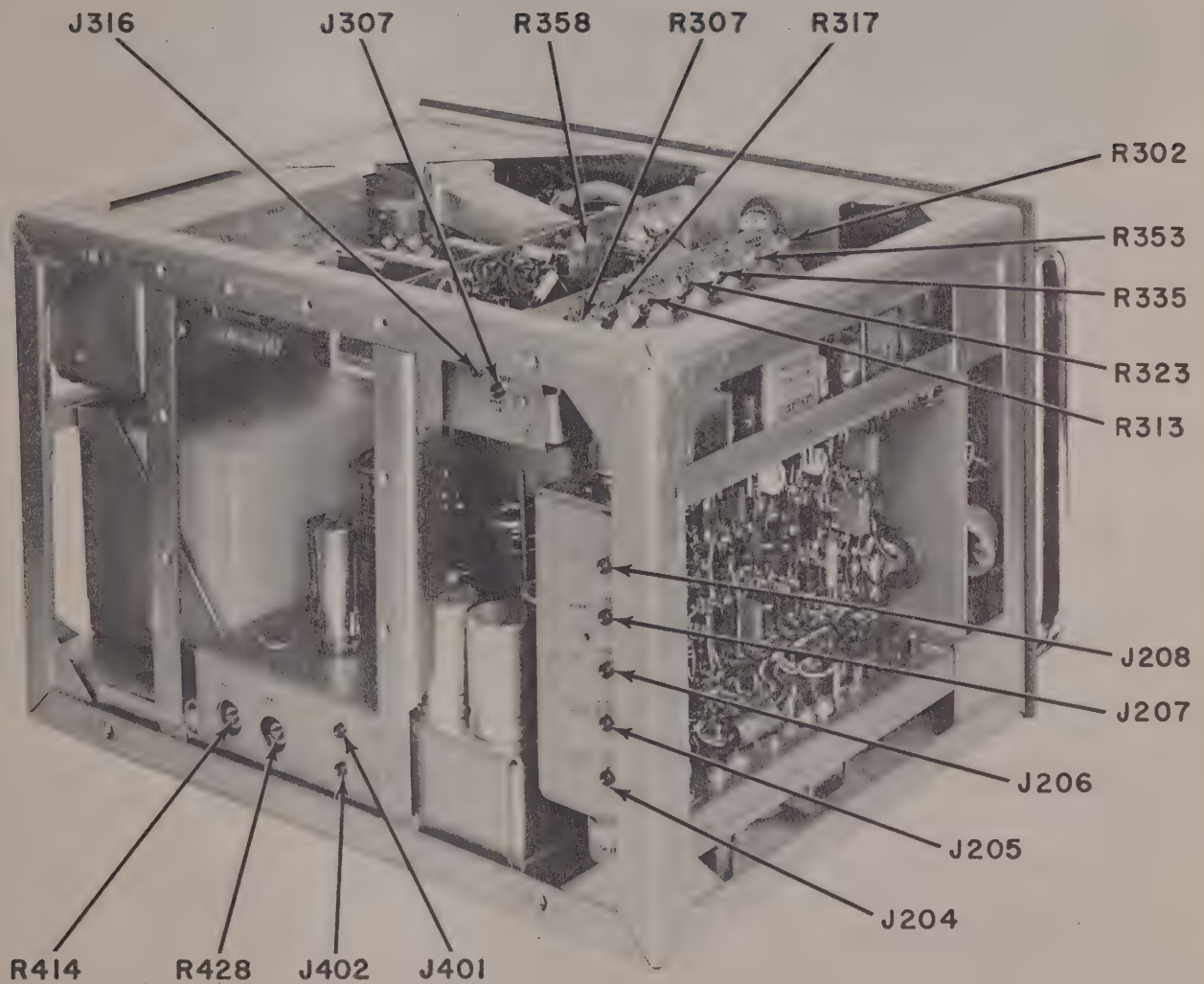


Figure 7-5. Location of Internal Adjustments and Test Jacks

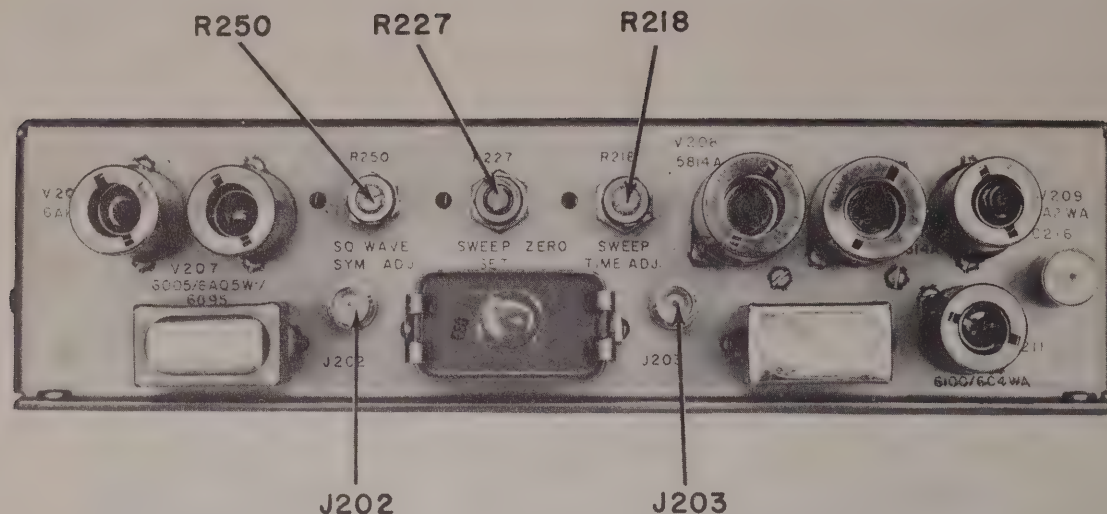


Figure 7-6. Modulator Chassis Showing Location of Square-wave Symmetry, Sweep Zero Set and Sweep Time Adjustments

7-17. SQUARE WAVE SYMMETRY ADJUSTMENT. (See figures 7-5 and 7-6.) To adjust the symmetry of the square wave, use the following procedure:

- Connect the vertical input (input 1 of Tektronix type 514D) of an oscilloscope to J207 and ground (chassis).
- Set trainer MODULATION SELECTOR switch to SQUARE position.
- Adjust the oscilloscope coarse and fine controls (SWEEP TIME and SWEEP TIME MULTIPLIER of Tektronix type 514D) until at least two square waves are displayed.
- Adjust SQ. WAVE SYM. ADJ. (R250) control until the square wave is symmetrical (on-time equals off-time).
- Lock control R250.

7-18. SWEEP ZERO SET ADJUSTMENT. (See figures 7-5 and 7-6.) Adjust the sweep zero using the following procedure:

- Set the trainer FIXED-SWEPT FREQ and MODULATION SELECTOR switches to SWEPT FREQ and CW-EXT MOD positions.
- Set a VTVM to "0" center d-c scale, and connect test prods to reflector triangle jack J205 and ground (chassis).
- Observe the meter needle and adjust SWEEP ZERO SET potentiometer R227, until the negative and positive excursions on either side of "0" are equal.
- Lock control R227.

7-19. SWEEP CENTER ADJUSTMENT. (See figure 7-5). To adjust the sweep center, use the following procedure:

- Set the trainer FIXED-SWEPT FREQ and MODULATION SELECTOR switches to SWEPT FREQ and CW-EXT MOD, respectively.
- Set a VTVM to "0" center d-c scale, and connect test prods to tuner grid triangle jack J316 and ground (chassis).
- Observe the meter needle and adjust SWEEP CENTER control R323 until the meter needle positive and negative excursions on either side of "0" are equal.
- Lock control R323.

7-20. REFLECTOR VOLTAGE TRACKING PROCEDURE.

7-21. This procedure assumes that the unit was previously aligned and operating, but that the trainer RF FREQ control is out of calibration, or the klystron was changed, or tracking adjustments were disturbed. Use the test set-up shown in figure 7-7 and the procedure described in paragraphs 7-22 through 7-26. The phase shifting network is Polarad type MK-1, or can be constructed as shown in figure 7-9. These paragraphs are concerned with the klystron reflector low and high limit adjustments.



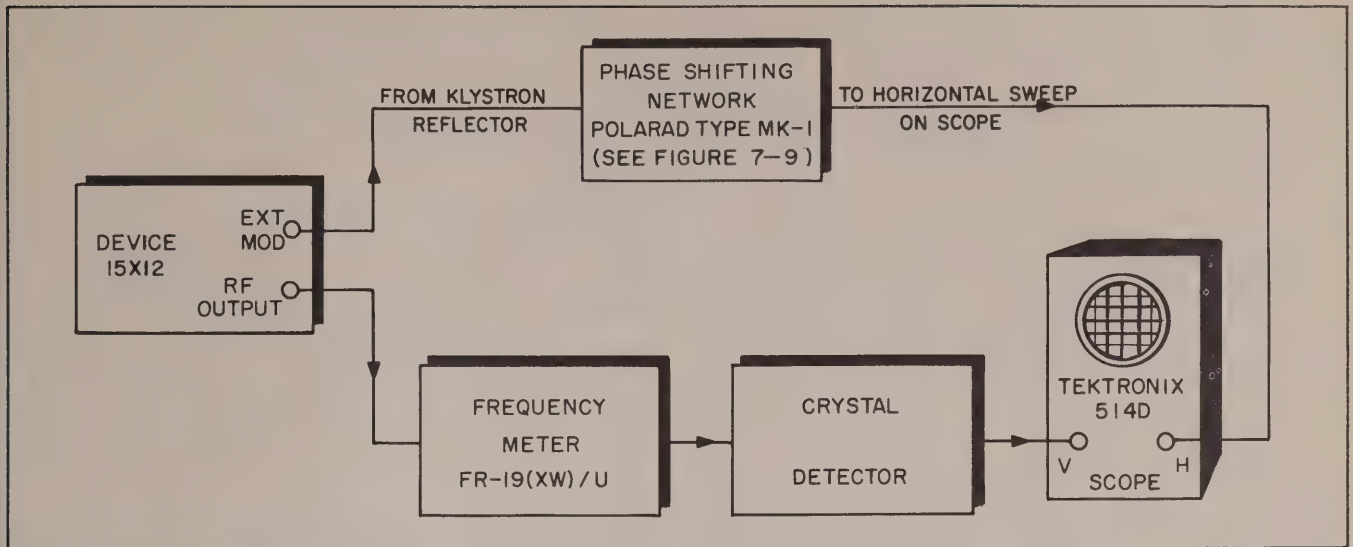


Figure 7-7. Test Set-up, Reflector Voltage Adjustments

7-22. LOW LIMIT CONTROL ADJUSTMENTS. (See figure 7-5.)

7-23. Set the trainer panel MODULATION SELECTOR, FIXED-SWEPT FREQ, and RF FREQ controls to CW-EXT MOD, FIXED and 0 positions, respectively. Adjust the low limit controls using the following procedure:

- Adjust the reflector LO LIM SET control R353 until the 3-3/4 mode trace is centered on the oscilloscope.
- Measure the frequency at center of trace. This frequency should be 8300 mc - 8500 mc. (See figure 7-8.)
- If the frequency is not as specified in step b, adjust the tuner grid LO LIM SET control R313.
- Readjust and lock R353 and R313, if necessary.
- Measure and note the low limit reflector and tuner grid d-c voltages, using a VTVM.

7-24. HIGH LIMIT CONTROL ADJUSTMENTS. (See figure 7-5.)

7-25. PROCEDURE. Set the trainer panel MODULATION SELECTOR, FIXED-SWEPT FREQ, and RF FREQ switches to CW-EXT MOD, FIXED and 100, respectively. Adjust the high limit controls, using the following procedure:

- Adjust the reflector HI LIM SET control R335 until the 3-3/4 mode trace is centered on the oscilloscope.
- Measure the frequency at center of trace. The frequency should be 9600 mc - 9800 mc.
- If the frequency is not as specified in step b, adjust the tuner grid HI LIM SET control R317.
- Readjust R335 and R317, if necessary.
- Measure and note the high limit reflector and tuner grid d-c voltages, using a VTVM.

## NOTE

Steps f and g are not pertinent to setting the high limit adjustments, but are required in making the sweep amplitude adjustments in paragraph 7-27.

f. Set the wavemeter to 9050 mc and vary the RF FREQ control until the dip is set to the center of the mode. (See figure 7-8.) Note the position of the RF FREQ control.

g. Measure and note the reflector and tuner grid d-c voltages, using a VTVM.

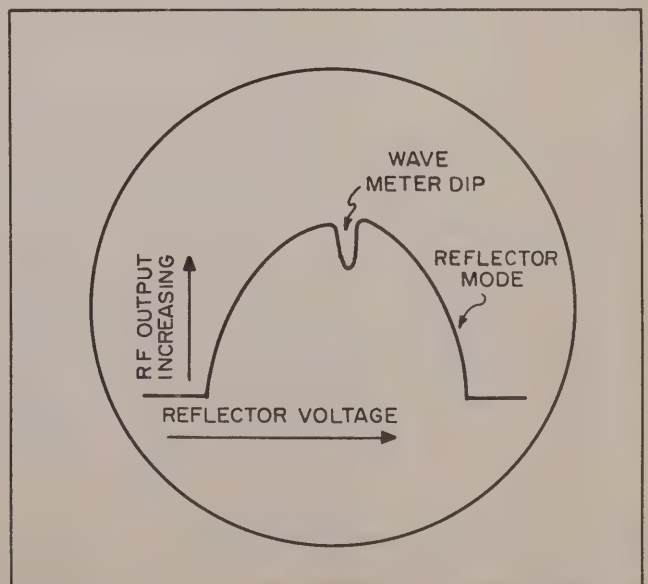


Figure 7-8. Typical Mode Trace

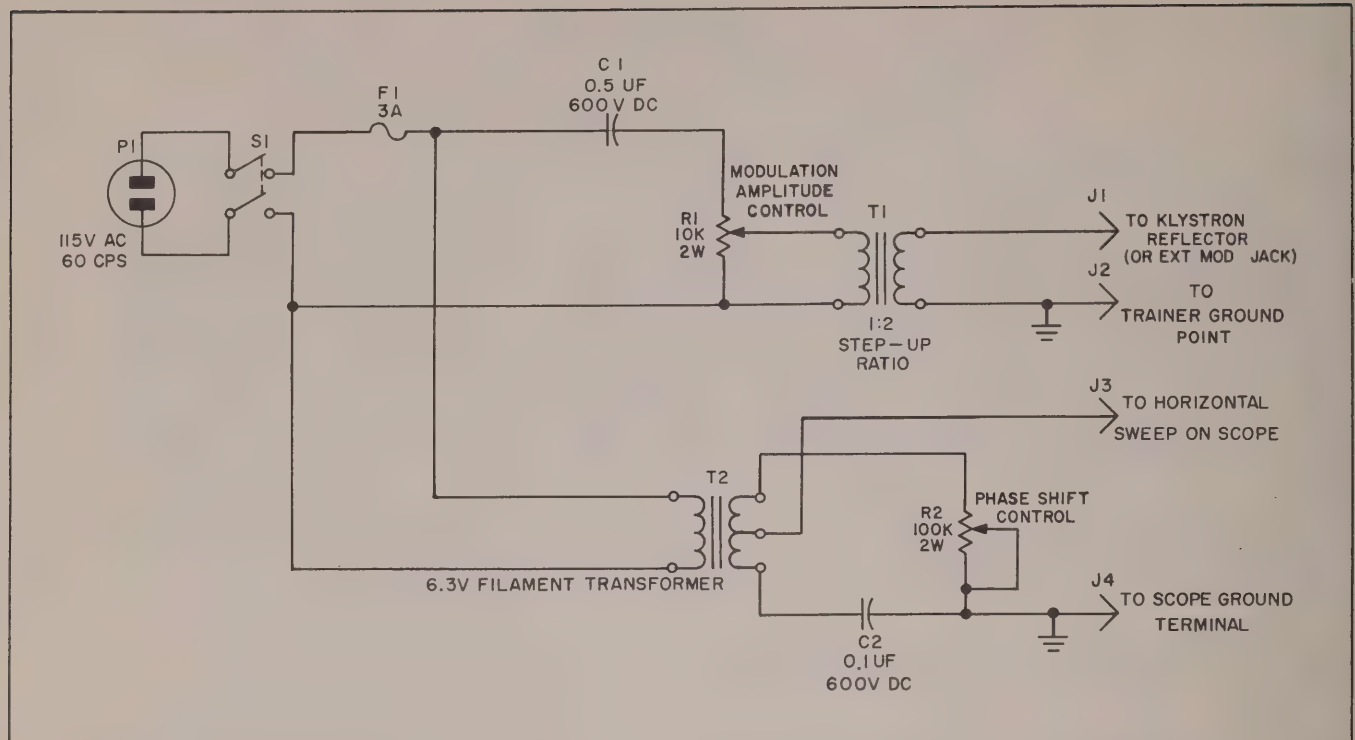


Figure 7-9. Phase Shifting Network, Schematic Diagram

7-26. READJUSTMENT OF LIMIT CONTROLS. Slight "touching up" of limit controls may be necessary after making the above adjustments. This is necessitated by interaction effects, brought about when variable components within the same circuit are adjusted simultaneously. Repeat paragraphs 7-22 through 7-25, readjusting controls, as necessary.

7-27. SWEEP AMPLITUDE CONTROLS. (See figure 7-5.)

7-28. Reflector voltages will vary with the sweep rate when the trainer is in swept frequency operation. The sweep amplitude controls must thus be adjusted until the voltages applied to the reflector and tuner grid vary between the low and high limit voltages measured in steps e of paragraphs 7-23 and 7-25. To adjust the reflector SWEEP AMPL (R302) and tuner grid SWEEP AMPL (R307) controls, set the trainer FIXED-SWEPT FREQ switch to SWEPT FREQ, SWEEP SECTOR to 1100, and SWEEP RATE to its maximum counterclockwise position. Set the RF FREQ control to the 9050 mc position, as determined in step f, paragraph 7-25.

- Connect the d-c VTVM to the klystron reflector (junction of J302 and C303) and ground.
- Vary the reflector SWEEP AMPL control (R302) until the meter fluctuates between reflector low and high limit d-c voltages, corresponding to those measured in steps e of paragraphs 7-23 and 7-25.

- Connect a d-c VTVM to the klystron tuner grid (J307) and ground.

d. Vary the tuner grid SWEEP AMPL control (R307) until the meter fluctuates between the tuner grid low and high limit d-c voltages, corresponding to those measured in steps e of paragraphs 7-23 and 7-25.

- Readjust and lock R302 and R307, if necessary.

7-29. SWEEP TIME ADJUSTMENT. (See figures 7-5 and 7-6.)

7-30. The sweep time adjustment is supplied to compensate for variations in the sweep rate timing network. It is a screwdriver factory adjustment and may, after an extended period of time, require re-adjustment. Set the trainer FIXED-SWEPT FREQ switch to SWEPT FREQ, SWEEP SECTOR (MC) switch to 250, and SWEEP RATE (MC/SEC) to 15. Then use the following procedure:

- Connect a VTVM to reflector triangle jack J205. The voltage will be seen to vary up and down.

b. Measure the time required for the voltage to rise from the minimum to the maximum value, for the sweep rate and sweep sector positions indicated above.

- The measured time should be 16.5 seconds; if it is not, readjust the SWEEP TIME ADJ control R218 until the voltage rise time is 16.5 seconds.



## SECTION VIII

## SUPPLEMENTARY DATA

## 8-1. STUDENT TESTING AND SCORING.

8-2. To judge the students' progress, periodic tests should be given. Chart 8-1 is supplied as a guide to the instructor in formulating these tests. The instructor may change the form in any way he sees fit to suit the particular training situation. Chart 8-1 tests the students' ability to absorb the demonstrations set forth in table 4-1. The test is given as follows:

a. The instructor adjusts the trainer operating controls so that the trainer emits the exact signal characteristics under which the radar set was jammed during the previous lessons.

b. The students under test operate the radar set and apply the technique of tracking through, developed in previous lessons.

c. The instructor stands near the students and rates their proficiency in tracking-through. The instructor then checks off the appropriate box on the test form (GOOD, FAIR, POOR) and enters any comments in the REMARKS column.

8-3. The instructor should keep a record of each student's ratings. (See chart 8-2.) This record will indicate how well the student has developed the anti-jamming technique (AVERAGE RATING). It will also indicate the areas in which the student needs more practice. Chart 8-2 is presented as a guide in setting up a record system of this type.

8-4. TRAINER TUBE COMPLEMENT. Table 8-1 lists the type of electron tubes, quantity per assembly, total quantity of each tube type, and total number of tubes per trainer.

## CAUTION

Should a tube require replacement, be sure to use the exact replacement, to prevent damage to the trainer. Refer to paragraph 7-14 when replacing the klystron tube, or any tube associated with a critical adjustment.

CHART 8-1. STUDENT SCORING FORM

TEST FORM NUMBER 1		NAME RANK SERIAL NO.		
DEMONSTRATION	STUDENT'S ABILITY TO TRACK THROUGH			REMARKS
	GOOD	FAIR	POOR	
CW interference				
CW interference in a swept frequency				
Changing sweep sector				
Changing sweep rate				
Interference by amplitude modulated signal				
Interference by square wave modulated signal				
Interference by pulse modulated signal				
Interference by noise modulated signal				

CHART 8-2. STUDENT RECORD

NAME _____		DATE STARTED _____	
RANK _____			
SERIAL NO. _____			
TEST NO.	DATE	AVERAGE RATING	REMARKS
1			
2			
3			
4			
5			

8-5. COMPONENT COLOR CODE. See figures 8-1 and 8-2.)

8-6. The resistive and capacitive components utilized in the trainer are identifiable by means of color codes. Figure 8-1 lists the resistor color codes. Figure 8-2 lists the capacitor color codes. Use the methods specified in these figures to determine the numerical value of any color-coded component utilized in the trainer design.

NOTE

To maintain the trainer at peak operating efficiency, replace all defective parts with their exact replacement.

8-7. PREPARING TRAINER FOR STORAGE.

8-8. To prepare the trainer for storage, refer to table 1-1 for items to be stored, and proceed as directed below:

a. Remove the 25-foot power cord W701 from the power source outlet and from the power input receptacle on the trainer front panel. Store the power cable in the dust cover of the trainer carrying case.

b. Disconnect the headset from the AUDIO connector receptacle on the trainer front panel. Store the headset in the dust cover of the trainer carrying case.

c. Disconnect the rf cable W601 from the RF OUTPUT connector receptacle on the trainer front panel. Disconnect the other end of the rf cable from the antenna. Store the cable and antenna in the dust cover of the trainer carrying case.

d. After checking that all accessories have been removed and securely stored in their resting place within the trainer dust cover, grasp the trainer by its two handles and lower it (face-up) into its carrying case. Place the dust cover with stored accessories over the top of the case and latch the hooks on the main body of the case to the hooks on the dust cover.

8-9. PREPARATION FOR RESHIPMENT.

8-10. To prepare the trainer for re-shipment, follow the instructions set forth in paragraph 8-7 and proceed as follows:

a. Prepare the original packing crate, referred to in paragraph 5-1, for re-use.

b. Pick up the trainer carrying case by its two handles and lower it gently into the packing crate.

c. Surround the carrying case with packing material.

CAUTION

Use care in hammering nails into the packing crate. Do not hammer unnecessarily or force nails into crate at an angle. Exercise extreme care in this operation to prevent damage to the trainer or its carrying case.

d. Close the crate, using a hammer and nails to secure the crate cover and sides.

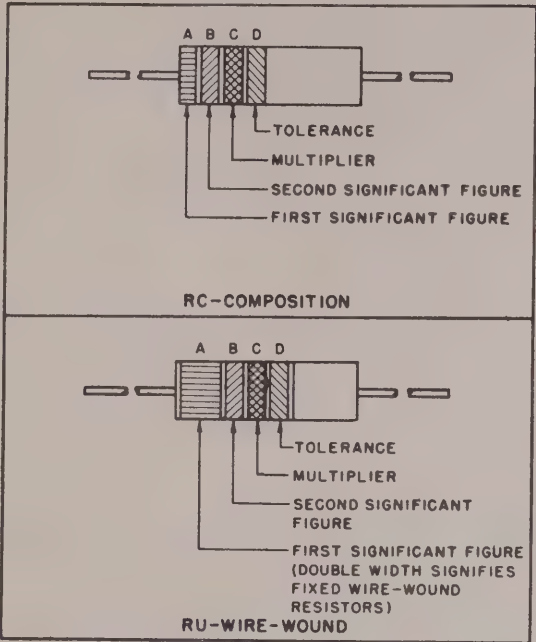


TABLE 8-1. TRAINER TUBE COMPLEMENT

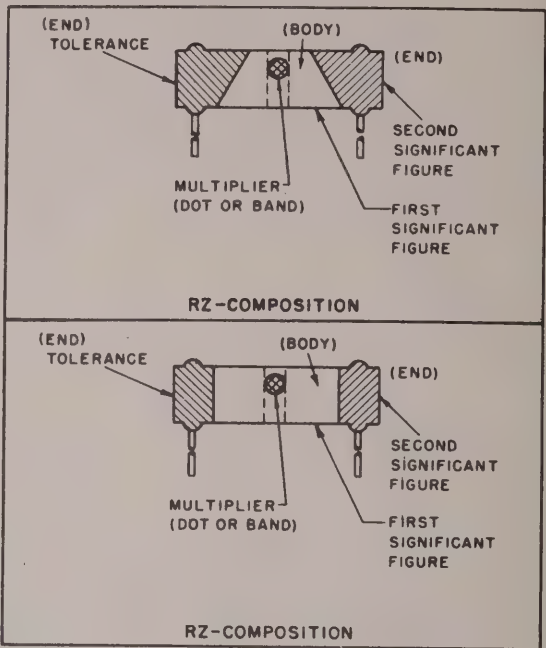
TYPE DESIGNATION	QUANTITY PER SECTION						APPLICATION
	AUDIO AMPLIFIER	MODULATOR CHASSIS	KEYER CHASSIS	POWER SUPPLY	KLYSTRON MOUNT	TOTAL QTY EACH TUBE TYPE	
OA2WA		1				1	Miniature voltage regulator tube
12AT7WA		1	1			2	High-mu twin triode
2K45					1	1	Reflex klystron
5R4WGA				1		1	Full-wave high vacuum rectifier, ruggedized
5651				1		1	Miniature voltage reference tube
5751				2		2	High-mu twin triode
5814A		3				3	Medium-mu twin triode
6AH6		1				1	Sharp-cutoff pentode
6AU6WA	2	2	2			6	Sharp-cutoff pentode
6D4		1				1	Noise generator tube
6L6WGB				1		1	Beam power tube
6X4W				2		2	Full-wave rectifier
6005/6AQ5W	1	1				2	Beam power tube
6080WA				2		2	Low-mu twin power triode
6100/6C4WA		1	3			4	High frequency triode
Total Quantity per Assembly	3	11	6	9	1	---	
Total Quantity per Trainer	-	-	-	-	-	30	

RESISTOR COLOR CODE MARKING  
(MIL-STD RESISTORS)

AXIAL-LEAD RESISTORS  
(INSULATED)



RADIAL-LEAD RESISTORS  
(UNINSULATED)



RESISTOR COLOR CODE

BAND A OR BODY*		BAND B OR END*		BAND C OR DOT OR BAND*		BAND D OR END*	
COLOR	FIRST SIGNIFICANT FIGURE	COLOR	SECOND SIGNIFICANT FIGURE	COLOR	MULTIPLIER	COLOR	RESISTANCE TOLERANCE (PERCENT)
BLACK	0	BLACK	0	BLACK	1	BODY	$\pm 20$
BROWN	1	BROWN	1	BROWN	10	SILVER	$\pm 10$
RED	2	RED	2	RED	100	GOLD	$\pm 5$
ORANGE	3	ORANGE	3	ORANGE	1,000		
YELLOW	4	YELLOW	4	YELLOW	10,000		
GREEN	5	GREEN	5	GREEN	100,000		
BLUE	6	BLUE	6	BLUE	1,000,000		
PURPLE (VIOLET)	7	PURPLE (VIOLET)	7				
GRAY	8	GRAY	8	GOLD	0.1		
WHITE	9	WHITE	9	SILVER	0.01		

\* FOR WIRE-WOUND-TYPE RESISTORS, BAND A SHALL BE DOUBLE-WIDTH. WHEN BODY COLOR IS THE SAME AS THE DOT (OR BAND) OR END COLOR, THE COLORS ARE DIFFERENTIATED BY SHADE, GLOSS, OR OTHER MEANS.

EXAMPLES (BAND MARKING):

10 OHMS  $\pm 20$  PERCENT: BROWN BAND A; BLACK BAND B; BLACK BAND C; NO BAND D.  
4.7 OHMS  $\pm 5$  PERCENT: YELLOW BAND A; PURPLE BAND B; GOLD BAND C; GOLD BAND D.

EXAMPLES (BODY MARKING):

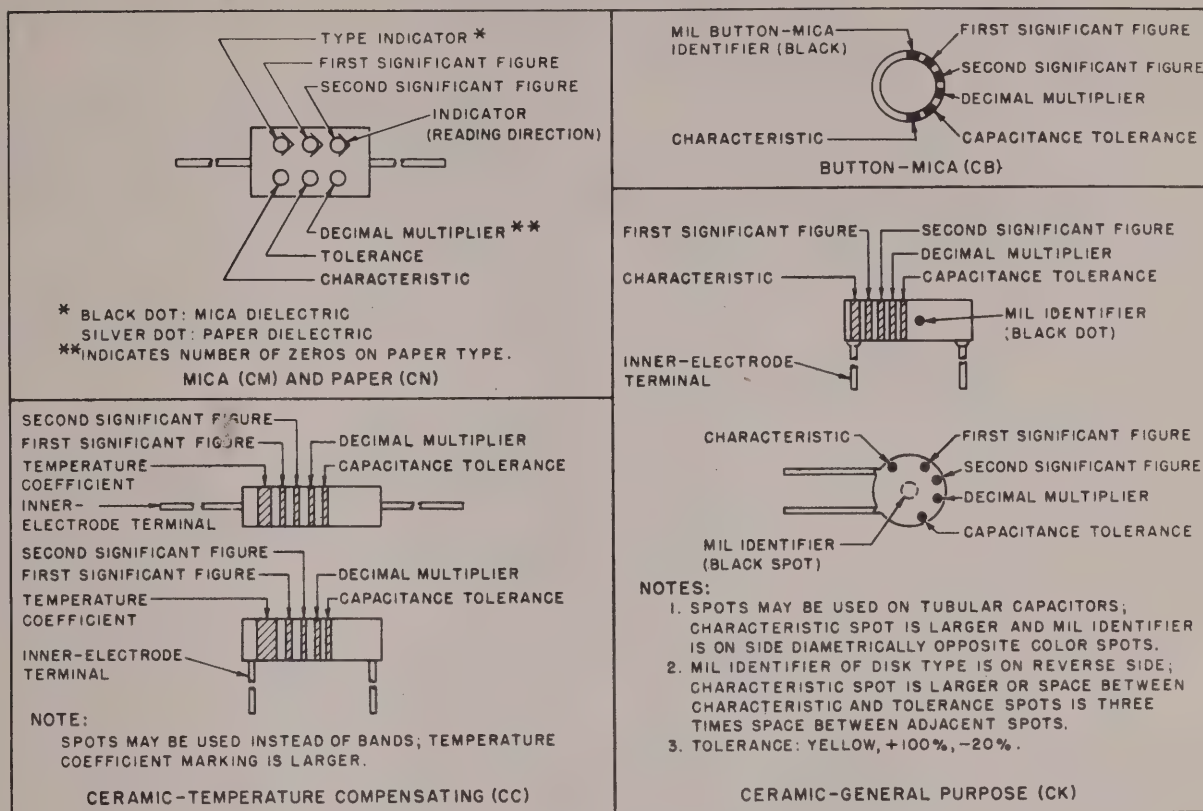
10 OHMS  $\pm 20$  PERCENT: BROWN BODY; BLACK END; BLACK DOT OR BAND; BODY COLOR ON TOLERANCE END.  
3,000 OHMS  $\pm 10$  PERCENT: ORANGE BODY; BLACK END; RED DOT OR BAND; SILVER END.

STD-R1

Figure 8-1. Resistor Color Codes



# CAPACITOR COLOR CODE MARKING (MIL-STD CAPACITORS)



## CAPACITOR COLOR CODE

COLOR	SIG FIG.	MULTIPLIER		CHARACTERISTIC <sup>1</sup>				TOLERANCE <sup>2</sup>					TEMPERATURE COEFFICIENT (UUF/UF/°C)
		DECIMAL	NUMBER OF ZEROS	CM	CN	CB	CK	CM	CN	CB	CC		
											OVER 10UUF	10UUF OR LESS	CC
BLACK	0	1	NONE		A			20	20	20	20	2	ZERO
BROWN	1	10	1	B	E	B	W				1		-30
RED	2	100	2	C	H		X	2		2	2		-80
ORANGE	3	1,000	3	D	J	D			30				-150
YELLOW	4	10,000	4	E	P								-220
GREEN	5		5	F	R						5	0.5	-330
BLUE	6		6		S								-470
PURPLE (VIOLET)	7		7		T	W							-750
GRAY	8		8			X						0.25	+30
WHITE	9		9								10	1	-330(±500) <sup>3</sup>
GOLD		0.1						5		5			+100
SILVER		0.01						10	10	10			

1. LETTERS ARE IN TYPE DESIGNATIONS GIVEN IN MIL-C SPECIFICATIONS.
2. IN PERCENT, EXCEPT IN UUF FOR CC-TYPE CAPACITORS OF 10 UUF OR LESS.
3. INTENDED FOR USE IN CIRCUITS NOT REQUIRING COMPENSATION.

STD-C1

Figure 8-2. Capacitor Color Codes

SECTION IX  
PARTS LIST AND CATALOG

9-1. GENERAL.

9-2. This section is a non-illustrated parts list and catalog. It lists the assemblies, sub-assemblies, and detail parts which comprise the Radar Signal Interference Trainer, Device 15X12, manufactured by Polarad Electronics Corporation, Long Island City 1, New York.

9-3. This section also includes an explanation of the method used in interpreting the parts list and catalog which consists of the following:

- a. Major Assembly Parts List.
- b. Numerical Parts List.
- c. Reference Symbol Number List.

9-4. MAJOR ASSEMBLY PARTS LIST. (See table 9-3.)

9-5. ITEM NUMBER COLUMN. This column contains consecutive item numbers which were assigned to parts as they appeared in the order of disassembly.

9-6. REFERENCE SYMBOL NUMBER COLUMN OR FIGURE AND INDEX COLUMN. This column lists reference symbol numbers which have been assigned to electrical parts. These numbers consist of one or two capital letters, followed by three or more significant figures which have been assigned to major assemblies in blocks. Table 9-2 lists each major assembly and its assigned block of numbers. If the user knows the reference symbol number of an electrical part, he can determine to which assembly it belongs. All reference symbol numbers listed are consistent with reference symbol numbers in other sections and drawings of this handbook.

9-7. For parts which have not been assigned reference symbol numbers, a figure and index number may appear in this column. The first two series of figures separated by a dash, being the figure number of an illustration appearing elsewhere in this manual; and the third figure referring to the index number of the part in the illustration.

9-8. PART NAME AND DESCRIPTION COLUMN. The part name and description column describes each assembly, sub-assembly, detail part and attaching part. Each part name and description is indented to show its relationship to the trainer assembly. Those parts which do not have Government Standard part numbers are fully described.

9-9. ATTACHING PARTS. Attaching parts are listed directly following the assembly or part they attach. A divider (\*-----\*) divides the last of the attaching parts from the next part or assembly.

9-10. PRIME CONTRACTOR'S DRAWING NUMBER (PART NUMBER). This column lists the individual item drawing numbers for parts on those drawings which have been contracted for by the contracting agency.

9-11. GOVERNMENT TYPE DESIGNATION NUMBER. The Government type designation number column lists the MIL, JAN, AN, MS, or other Government type designations assigned to the part in question.

9-12. COMMERCIAL MANUFACTURER AND CATALOG DESIGNATIONS. This column contains the vendor's code and catalog designation of the manufacturer of each purchased part used in the manufacture of the trainer. Table 9-1 lists each code and the corresponding vendor's name and address.

9-13. NUMERICAL PARTS LIST. (See table 9-4.)

9-14. The numerical parts list is useful in locating detailed item information. It lists in alpha-numerical sequence each item of the equipment in the major assembly parts list, cross-referenced against its respective manufacturer's code, item number, government stock number and source code. In addition, this list also indicates the quantity per kit and the quantity per trainer of each part listed.

9-15. PART NUMBER COLUMN. This column lists the part number of the particular part in question and corresponds to the number entered in column 4, 5, or 6 of the Major Assembly Parts List. These part numbers are arranged alpha-numerically in the following manner:

a. The part number arrangement starts on the left hand column and continues from left to right, one column at a time, until the part number arrangement is determined.

b. The order of precedence in part number arrangement is as follows:

- Space (blank column)
- Diagonal (slant) /
- Point (period)
- Dash (-)
- Letters A through Z
- Numerals 0 through 9

9-16. MANUFACTURER'S CODE COLUMN. The manufacturer's code is that code listed in table 9-3 which corresponds to the manufacturer of the particular part in question.

9-17. ITEM NUMBER COLUMN. This column lists the item number of the item's first appearance in the Major Assembly Parts List.



9-18. **GOVERNMENT STOCK NUMBER COLUMN.** This column provides for government stock numbers which have been assigned to individual parts by SIGSU. Government stock numbers not presently included will, upon assignment, be included in future revisions of this manual.

9-19. **QUANTITY PER KIT.** If an item in the Numerical Parts List has been provided as part of the Equipment Repair Parts Kit, the quantity of each item supplied is listed in this column.

9-20. **QUANTITY PER TRAINER.** This column lists the total quantity of each part used in the trainer assembly.

9-21. **REFERENCE SYMBOL NUMBER LIST.** (See table 9-5.)

9-22. **REFERENCE SYMBOL NUMBER COLUMN.** This column lists, in alpha-numerical sequence, reference symbol numbers assigned to electrical parts which are used in the trainer assembly.

9-23. **PART NUMBER COLUMN.** This column lists the part number of each part which has been assigned a reference symbol number.

9-24. **ITEM NUMBER COLUMN.** This column lists the item number of each reference symbol number and part as it appears on the Major Assembly Parts List.

9-25. **HOW TO FIND A PART NUMBER.**

9-26. If the reference symbol number is known, use the following procedure:

- a. Turn to the Reference Symbol Number List.
- b. Locate the reference symbol number in the first column for the particular part in question.
- c. Cross-referenced against the reference symbol number is the part number and item number as they appear in the Major Assembly Parts List.

9-27. **HOW TO FIND THE DESCRIPTION OF A PART.**

9-28. If the part number is known, use the following procedure:

- a. Locate the part number in the Numerical Parts List.
- b. Cross-referenced against the part number is the item number of the part as it appears on the Major Assembly Parts List.
- c. When the item number has been determined as described in step b, turn to the Major Assembly Parts List.
- d. Locate the item number in the Major Assembly Parts List. Cross-referenced to the item number will be found a description of the part in question.

9-29. **HOW TO ORDER REPAIR PARTS.**

9-30. Parts should be ordered according to applicable local procedures for Army Training Devices.

## RADAR SIGNAL INTERFERENCE TRAINER (X-BAND)

DEVICE 15X12

TABLE 9-1 LIST OF MANUFACTURERS

<u>CODE</u>	<u>MANUFACTURER</u>	<u>ADDRESS</u>
	Jan Hardware Mfg. Corp.	Brooklyn, New York
	Mepco Inc.	Morristown, New Jersey
	Rotating Components Inc.	Brooklyn, New York
AAEP	Augat Brothers Inc.	Attleboro, Massachusetts
AG	Agastat Div. of American Gas Accumulator Co.	Elizabeth, New Jersey
BBR	Birnbach Radio Co.	New York, New York
CGT	Cambridge Thermionic Corp.	Cambridge, Massachusetts
CLC	Camloc Fastener Corp.	Paramus, New Jersey
DABU	Dale Products Inc.	Columbus, Nebraska
EN	Elastic Stop Nut Corp.	Union, New Jersey
FLN	The Nylock Corp.	New York, New York
HALK	Halkey-Roberts Corp.	Paramus, New Jersey
HAW	Harvey Hubbell Inc.	Bridgeport, Connecticut
HBCO	Hubbell Corp.	Chicago, Illinois
MRQ	Minor Rubber Co., Inc.	Bloomfield, New Jersey
RAY	Raytheon Mfg. Co.	Waltham, Massachusetts
SH	Shakeproof Inc. Div. of Illinois Tool Works	Chicago, Illinois
SHH	Herman H. Smith Inc.	Brooklyn, New York
SOCH	South Chester Corp.	Chester, Pennsylvania
TRH	Trimm Inc.	Libertyville, Illinois
TTE	Times Facsimile Corp.	New York, New York
TTM	Torrington Mfg. Co.	Torrington, Connecticut
ULC	George Ulanet Co.	Newark, New Jersey
VIEC	Victory Engineering Corp.	Newark, New Jersey
WIQ	Winchester Electronics Co.	Glenbrook, Connecticut
ZE	Zierick Mfg. Corp.	New Rochelle, New York



RADAR SIGNAL INTERFERENCE TRAINER (X-BAND)

DEVICE 15X12

TABLE 9-2 LIST OF MAJOR ASSEMBLIES

<u>MAJOR ASSEMBLY</u>	<u>REFERENCE SYMBOL SERIES</u>	<u>FIRST PAGE NO.</u>
RADAR SIGNAL INTERFERENCE TRAINER (X-BAND)		48
FRONT PANEL ASSEMBLY	101 to 599	49
KEYER CHASSIS	300	56
KLYSTRON TUBE MOUNT and WAVEGUIDE ASSEMBLY	301 to 599	64
AUDIO AMPLIFIER CHASSIS	100	68
MODULATOR CHASSIS	200	72
POWER SUPPLY CHASSIS	400	83

TABLE 9-3 MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES Radar Signal Interference Trainer (X-Band) - 101 to 899
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
1	1-1	TRAINER, RADAR SIGNAL INTERFERENCE X BAND, DEVICE 15X12										
2	1-1	COVER, TRANSIT CASE; aluminum, w/neoprene rubber bumpers and gasket per Spec MIL-B-2765A, over-all dim. 19-23/32 in. lg by 13-25/32 in. wide by 2-15/16 in. deep										
3		STUD ASSEMBLY, TURNLOCK FASTENER; wing head stud, spring loaded, stainless steel, projects 19/32 in. from surface of material when closed										
4	1-1	BOX ASSEMBLY, TRANSIT CASE; aluminum, w/neoprene rubber bumpers per Spec MIL-B-2765A, stenciled words "DEVICE 15X12"; over-all dim. 19-23/32 in. lg by 13-25/32 in. wide by 18-5/16 in. deep										
5		VALVE, SAFETY RELIEF; nickel plated brass; supplied w/ attaching hardware; over-all dim. when closed: 5/16 in. dia by 5/16 in. deep										
6		SEAL, RUBBER, ROUND SECTION: 0.562 ID, 0.750 OD										
7	W701	CABLE ASSEMBLY, RADIO FREQUENCY										
8	P309	CONNECTOR, PLUG, ELECTRICAL; series N (MIL-C-71A)										
9	P501	CONNECTOR, PLUG, ELECTRICAL; same as item 8										
10		CABLE, RADIO FREQUENCY: polyethylene dielectric, 7 strands, silver plated copper										
11	W601	CABLE ASSEMBLY, POWER, ELECTRICAL										
12	P406	CONNECTOR, PLUG, ELECTRICAL; 10 amp, 2 female contacts, w/cable clamp, over-all dim. 1.375 in. dia by 2.008 in. lg										
13	P701	CONNECTOR, PLUG, ELECTRICAL; 10 amp, 2 male contacts, blade type, polarized, w/cable clamp, over-all dim. 1.531 in. dia by 1.440 in. lg excluding blades										
14		CABLE, POWER, ELECTRICAL: 2 wires; 16 AWG										
15	HT101	HEADSET, ELECTRICAL; 600 ohm, 2-1/8 in. dia ear piece, adjustable steel headband										
											AN123866	CLC 2600-4SW
										BI16390	UG-21B/U	HALK 200-AC
											UG-21B/U	
											RG-9/U (MIL-C-17)	
										BI16397		HAW 7506
												HAW 7547
											CO-02MFF(2/16)SJ0375 (MIL-C-3432A)	TRII 156



Table 9-3

NAVEXOS P-1856

Section IX

## MAJOR ASSEMBLY PARTS LIST

MAJOR ASSEMBLY PARTS LIST										CONTRACT NO.		DEVICE NO.		MAJOR ASSEMBLY AND NO. SERIES	
Radar Signal Interference Trainer (X-Band)										N61339-29		15X12		Front Panel Assembly - 101 to 599	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMENT M'FGR. AND CATALOG DESIGNATION (6)			
16	A801	.	ANTENNA HORN ASSEMBLY								C107607	AN515-4-5  AN935-4L			
17	J501	.	CONNECTOR, RECEPTACLE, ELECTRICAL; modified UG-58/U by adding an extension probe 0.312 in. lg of silver plated brass								A107612				
18		.	ATTACHING PARTS												
19		.	SCREW, MACH; #4-40 thread												
		.	WASHER, LOCK; #4												
		.	*-----*												
20	E801	.	ANTENNA, HORN; 356-T6 aluminum, over-all dim. 2-11/32 in. lg by 1-27/32 in. high by 2-1/4 in. deep								B107609				
21		.	DUST COVER ASSEMBLY; aluminum; box shape, over-all dim. excluding louvers: 17-29/32 in. lg by 11-29/32 in. high by 13-19/32 in. deep								C111990				
22		.	ATTACHING PARTS										SOCH 12-11-205-12		
		.	SCREW, EXTERNALLY RELIEVED BODY: stainless steel; tapered shank 0.230 in. dia under head to 0.176 in. dia at tip; over-all dim: 1/2 in. dia slotted head by 0.611 in. lg shank												
23		.	WASHER, LOCK; nickel silver; over-all dim: 3/16 in. ID by 7/16 in. OD by 0.020 in. thk										SOCH 11014-11		
		.	*-----*												
24		.	STUD, TURNLOCK FASTENER: stainless steel w/nylon washer under head; slotted head; over-all dim: 0.306 in. dia head by 7/16 in. lg shank										CLC 5S5-14		
25		.	WASHER, SPLIT; spring steel; over-all dim: 5/16 in. ID by 0.271 in. OD by 0.016 in. thk										CLC 5S3-1		
26	1-1	.	TRAINER, RADAR SIGNAL INTERFERENCE ASSEMBLY								D110178				
27	2-1	.	FRONT PANEL ASSEMBLY								D111748				
		.	ATTACHING PARTS												
28		.	SCREW, MACH; binding head, cadmium plated steel, 10-24 thread by 3/8 in. lg								A512475				
29		.	WASHER, LOCK; #10									AN936B10			
		.	*-----*												

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)			GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	Front Panel Assembly - 101 to 599 COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
30		.	.	.	.	.	.	.	HANDLE, BOW; nickel plated brass w/two 10-32 internal taps 1/2 in. deep on 9 in. centers	N61339-29	15X12		
31		.	.	.	.	.	.	.	ATTACHING PARTS				
32		.	.	.	.	.	.	.	SCREW, MACH; #10-32 thread			AN510-10-8	
33	2-1.4	.	.	.	.	.	.	.	WASHER, LOCK; #10			AN936C10	
		.	.	.	.	.	.	.	*-----*				
34	2-1.3	.	.	.	.	.	.	.	KNOB; bakelite, w/skirt, for use on 1/4 in. dia shafts, supplied w/attaching hardware, over-all dim. 0.928 in. dia by 1.027 in. deep				RAY 90-3-2
35	2-1.7	.	.	.	.	.	.	.	KNOB; bakelite, for use on 1/4 in. dia shafts, supplied w/attaching hardware, over-all dim. 0.938 in. dia by 0.803 in. deep				RAY 70-4-2
36	R230	.	.	.	.	.	.	.	KNOB; bakelite, w/skirt, for use on 1/4 in. dia shafts, supplied w/attaching hardware, over-all dim. 1.269 in. dia by 1.088 in. deep	Bill027			RAY 125-3-2
37	S201	.	.	.	.	.	.	.	RESISTOR, VARIABLE, COMPOSITION; 2 sections; 5 meg-ohms $\pm 20\%$ , 2 watts; taper symbol F; supplied w/attaching hardware; over-all body dim. excluding terminals: 1-3/16 in. dia by 1-17/64 in. lg				
38	R399	.	.	.	.	.	.	.	SWITCH, ROTARY; ceramic, one section, 2 poles, 3 positions, non-shorting type, over-all dim: 1-5/8 in. dia by 2 in. lg by 1-7/8 in. high	D111995			
39	M301	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1200 ohms $\pm 10\%$ , 2 watts			RC42GF122K (MIL-R-11B)	
40	S301	.	.	.	.	.	.	.	AMMETER; dc				
41	R278	.	.	.	.	.	.	.	SWITCH, ROTARY; ceramic, 4 sections, 2 poles per section, 5 positions, non-shorting type; overall dim: 1-5/8 in. dia by 2-31/32 in. lg by 1-7/8 in. high	D111994		MR26W002DCMA (MIL-M-6A)	
42	S302	.	.	.	.	.	.	.	RESISTOR, VARIABLE, COMPOSITION; 100,000 ohms $\pm 10\%$ , 2 watts				
		.	.	.	.	.	.	.	SWITCH, ROTARY; ceramic, 2 sections, 2 poles per section, 3 positions, shorting type, over-all dim. 1-5/8 in. dia by 2-15/32 in. lg by 1-7/8 in. high	D111997		RV4NA VSD104A (MIL-R-94A)	

CGT X2111-C-BO

## MAJOR ASSEMBLY PARTS LIST

Radial Signal Interference Trainer (X-Band)							CONTRACT NO. N61339-29	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5				GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	Front Panel Assembly - 101 to 599 COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
43	R220	.	.	.	.	.	.	B113113			
		RESISTOR, VARIABLE, COMPOSITION; 3 sections, section A and B data: 5 megohm $\pm 20\%$ , 2 watts, taper symbol F, section C data: 50,000 ohms $\pm 10\%$ , 2 watts, taper symbol A, supplied w/attaching hardware, over-all body dim. excluding terminals: 1-3/16 in. dia by 1-53/64 in. lg									
44	R315	.	.	.	.	.	.	B112009			
		RESISTOR, VARIABLE, COMPOSITION; 2 sections, section A data: 500,000 ohms $\pm 10\%$ , 2 watts, taper symbol A; section B data: 50,000 ohms $\pm 10\%$ , 2 watts, taper symbol A; supplied w/attaching hardware, over-all body dim. excluding terminals: 1-5/32 in. dia by 1-17/64 in. lg									
45	R214	.	.	.	.	.	.	B111992			
		RESISTOR, VARIABLE, COMPOSITION; 2 sections, 25,000 ohms $\pm 10\%$ , 2 watts, taper symbol A, supplied w/attaching hardware, over-all body dim. excluding terminals: 1-5/32 in. dia by 1-17/64 in. lg									
46	R115	.	.	.	.	.	.			RV4NAVSD504A (MIL-R-94A)	
47	S303	.	.	.	.	.	.	D111998			
		SWITCH, ROTARY; ceramic, one section, 3 poles, 2 positions, non-shorting type, over-all dim: 1-5/8 in. dia by 2 in. lg by 1-7/8 in. high									
48	J406	.	.	.	.	.	.				HBCO 7524
		CONNECTOR, RECEPTACLE, ELECTRICAL; 2 female contacts, polarized, 2 mounting holes 0.146 in. dia on 1-11/16 in. centers, over-all dim. 2-1/32 in. dia by 1.375 in. deep									
49		ATTACHING PARTS									
		SCREW, MACH; binding head, cadmium plated steel, 6-32 NC-2 thread by 3/8 in. lg					A512446				
50		WASHER, LOCK; #6								AN936B6	
51		NUT, HEX; #6-32 thread								AN340-6	
		*****									
52	F401	.	.	.	.	.	.				FO3G3R00B (MIL-F-15160C)
		FUSE, CARTRIDGE; 3 amp									
53	F402	.	.	.	.	.	.				
		FUSE, CARTRIDGE; same as item 52									
54	F403	.	.	.	.	.	.				
		FUSE, CARTRIDGE; same as item 52									
55	F404	.	.	.	.	.	.				
		FUSE, CARTRIDGE; same as item 52									



## Section IX

## NAVEXOS P-1856

## Table 9-3

## MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radar Signal Interference Trainer (X-Band)							CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	15X12	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	Front Panel Assembly - 101 to 599 COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
56	F405	.	.	.	.	.	.	FUSE, CARTRIDGE; same as item 52				
57	F406	.	.	.	.	.	.	FUSE, CARTRIDGE; same as item 52				
58	XF401	.	.	.	.	.	.	FUSEHOLDER; extractor post type				
59	XF402	.	.	.	.	.	.	FUSEHOLDER; same as item 58				
60	XF403	.	.	.	.	.	.	FUSEHOLDER; same as item 58				
61	XF404	.	.	.	.	.	.	FUSEHOLDER; same as item 58				
62	XF405	.	.	.	.	.	.	FUSEHOLDER; same as item 58				
63	XF406	.	.	.	.	.	.	FUSEHOLDER; same as item 58				
64	2-1.19	.	.	.	.	.	.	PLATE, IDENTIFICATION; 15X12				
65		.	.	.	.	.	.	ATTACHING PARTS SCREW, DRIVE; #2-56 thread *-----*				
66	S401	.	.	.	.	.	.	SWITCH, ROTARY; ceramic, 1 section, 3 poles, 3 positions, shorting type, over-all dim. 1-5/8 in. dia by 2 in. lg by 1-7/8 in. high	D111996			
67	DS401	.	.	.	.	.	.	LAMP, INCANDESCENT, 6V				
68	DS402	.	.	.	.	.	.	LAMP, GLOW; neon filled				
69	XDS401	.	.	.	.	.	.	LIGHT, INDICATOR; red faceted jewel, stovepipe shape				
70	XDS402	.	.	.	.	.	.	LIGHT, INDICATOR; amber plain jewel, stovepipe shape				
71	2-1.16	.	.	.	.	.	.	COVER, TELEPHONE JACK; enamel painted CRES, w/ spring; max over-all dim.: 1-3/32 in. lg by 13/16 in. dia of cover by 11/32 in. high				
72	J102	.	.	.	.	.	.	JACK, TELEPHONE; 3/8 in. dia bushing mounted, switching action: opens one				
73	J308	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; BNC, non-constant impedance type				
74		.	.	.	.	.	.	CLAMP, CABLE; nylon, 0.422 in. dia max cable size accommodated	B517506			

JAN HARDWARE  
MFG CORP. J1301-3JJ-089  
(MIL-J-641A)UG-625A/U  
(MIL-C-3608)

NE-51 (MIL-L-15098B)

LH50PR5 (MIL-L-3661)

LH64PA5 (MIL-L-3661)

MS15571-2

GFP

AN535-2-2

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	Front Panel Assembly - 101 to 599 COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)	
75		.	.	.	ATTACHING PARTS								
76		.	.	.	SCREW, MACH; same as item 49								
77		.	.	.	WASHER, LOCK; same as item 50								
78		.	.	.	WASHER, FLAT; cadmium plated steel, 0.149 in. ID, 0.357 in. OD, 0.32 in. thk				A503613				
		.	.	.	NUT, HEX; same as item 51								
		.	.	.	*-----*								
79	W201	.	.	.	CABLE ASSEMBLY, RADIO FREQUENCY				B112008-4		MX-1530/U		
80	E212	.	.	.	TERMINAL, FEEDTHRU; end seal series, not weather- proof (dwg no. REB49142)						UG-260B/U (MIL-C-3608)		
81	P203	.	.	.	CONNECTOR, PLUG, ELECTRICAL; BNC 50 ohm constant impedance						RG-62/U (MIL-C-17)		
82		.	.	.	CABLE, RADIO FREQUENCY; semi-solid polyethylene dielectric, two 22 AWG copperweld conductors								
83	W202	.	.	.	CABLE ASSEMBLY, RADIO FREQUENCY				B112008-3				
84	E213	.	.	.	TERMINAL, FEEDTHRU; same as item 80								
85	P202	.	.	.	CONNECTOR, PLUG, ELECTRICAL; same as item 81								
86		.	.	.	CABLE, RADIO FREQUENCY; same as item 82								
87	W303	.	.	.	CABLE ASSEMBLY, RADIO FREQUENCY				B112008-2				
88	E307	.	.	.	TERMINAL, FEEDTHRU; same as item 80								
89	P304	.	.	.	CONNECTOR, PLUG, ELECTRICAL; same as item 81								
90		.	.	.	CABLE, RADIO FREQUENCY; same as item 82								
91	W304	.	.	.	CABLE ASSEMBLY, RADIO FREQUENCY				B112008-1				
92	E308	.	.	.	TERMINAL, FEEDTHRU; same as item 80								
93	P305	.	.	.	CONNECTOR, PLUG, ELECTRICAL; same as item 81								
94		.	.	.	CABLE, RADIO FREQUENCY; same as item 82								

## MAJOR ASSEMBLY PARTS LIST

MAJOR ASSEMBLY PARTS LIST									
Radar Signal Interference Trainer (X-Band)									
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)
95		.	.	.	.	.	.	.	BRACKET, ANGLE; iridited aluminum, L shape, over-all dim.: 2-1/8 in. lg by 1-7/8 in. wide by 5/8 in. deep
96		.	.	.	.	.	.	.	BRACKET, ANGLE; iridited aluminum, modified L shape, over-all dim.: 1-3/4 in. lg by 1-11/16 in. wide by 5/8 in. deep
97		.	.	.	.	.	.	.	ATTACHING PARTS
98		.	.	.	.	.	.	.	SCREW, MACH; same as item 49
99		.	.	.	.	.	.	.	WASHER, LOCK; same as item 50
		.	.	.	.	.	.	.	NUT, HEX; same as item 51
		.	.	.	.	.	.	.	*-----*
100	W301	.	.	.	.	.	.	.	CABLE ASSEMBLY, RADIO FREQUENCY
101	J309	.	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; series N, 50 ohm constant impedance
102	P310	.	.	.	.	.	.	.	CONNECTOR, PLUG, ELECTRICAL; same as item 8
103		.	.	.	.	.	.	.	CABLE, RADIO FREQUENCY; same as item 10
104		.	.	.	.	.	.	.	CLAMP, CABLE; same as item 74
105		.	.	.	.	.	.	.	ATTACHING PARTS
106		.	.	.	.	.	.	.	SCREW, MACH; same as item 49
107		.	.	.	.	.	.	.	WASHER, LOCK; same as item 50
108		.	.	.	.	.	.	.	WASHER, FLAT; same as item 77
		.	.	.	.	.	.	.	NUT, HEX; same as item 51
		.	.	.	.	.	.	.	*-----*
109	P403	.	.	.	.	.	.	.	CONNECTOR, PLUG, ELECTRICAL; 20 male contacts, polarized
110		.	.	.	.	.	.	.	SHIELD, ELECTRICAL CONNECTOR; aluminum, w/cable clamp, 7/16 in. dia max cable size accommodated, over-all dim, excluding cable clamp: 1-1/32 in. lg by 1-5/16 in. wide by 1/2 in. deep
111	A304	.	.	.	.	.	.	.	BRACKET ASSEMBLY, FRONT PANEL



Table 9-3

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Section IX

## MAJOR ASSEMBLY PARTS LIST

MAJOR ASSEMBLY PARTS LIST									
Radar Signal Interference Trainer (X-Band)									
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)
112		.	.	.	.	.	.	.	ATTACHING PARTS
113		.	.	.	.	.	.	.	SCREW, MACH; same as item 49
114	J301	.	.	.	.	.	.	.	WASHER, LOCK; same as item 50
115		.	.	.	.	.	.	.	*-----*
116	J201	.	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; 41 female pins
117		.	.	.	.	.	.	.	ATTACHING PARTS
118	J101	.	.	.	.	.	.	.	WASHER, LOCK; #4
119		.	.	.	.	.	.	.	*-----*
120	J306	.	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; 34 female pins
121		.	.	.	.	.	.	.	ATTACHING PARTS
122		.	.	.	.	.	.	.	WASHER, LOCK; same as item 115
123	A501	.	.	.	.	.	.	.	*-----*
124		.	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; same as item 73
125		.	.	.	.	.	.	.	GROMMET, RUBBER; 3/4 in. ID
126		.	.	.	.	.	.	.	TERMINAL LUG; hot tin dipped phosphor, mounts by #6 screw size hole, over-all length: 41/64 in.
		.	.	.	.	.	.	.	TERMINAL BOARD ASSEMBLY
		.	.	.	.	.	.	.	ATTACHING PARTS
		.	.	.	.	.	.	.	SCREW, MACH; same as item 49
		.	.	.	.	.	.	.	WASHER, FLAT; same as item 77
		.	.	.	.	.	.	.	WASHER, LOCK; same as item 50
		.	.	.	.	.	.	.	*-----*

MAJOR ASSEMBLY AND NO. SERIES

DEVICE NO.

CONTRACT NO.

PRIME CONTRACTOR'S

DRAWING NO.

(PART NO.)

(4)

GOVERNMENT TYPE DESIGNATION

AND SPECIFICATION NUMBER

(5)

Front Panel Assembly - 101 to 599

COMMERCIAL M'FGR.

AND CATALOG DESIGNATION

(6)

SH 210406-00

B111756

AN931-12-17 (MIL-G-3036)

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)	
127	C304	.	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 100,000 uuf $\pm 10\%$ , 200 vdc		CP05A1EC104K (MIL-C-25A)		
128	R330	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 100,000 ohms $\pm 10\%$ , 1/2 watt		RC20GF104K (MIL-R-11B)		
129	TB501	.	.	.	.	.	.	.	TERMINAL BOARD; phenolic material, 20 terminals included and accommodated, over-all dim.: 3-1/8 in. lg by 1-3/16 in. wide by 1/8 in. thk	B111755			
130		.	.	.	.	.	.	.	BRACKET; iridited aluminum, triangular shape, over-all dim.: 4-5/32 in. lg by 2-5/8 in. high by 3-13/16 in. deep	C112007			
131		.	.	.	.	.	.	.	PANEL; zinc chromate finished aluminum w/face painted olive drab, over-all dim.: 17-3/4 in. lg by 11-43/64 in. wide by 1/8 in. thk	D111993			
132	10-9	.	.	.	.	.	.	.	KEYER CHASSIS	D110317			
133		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; binding head, cadmium plated steel, 8-32 NC-2 by 3/8 in. lg	A512461			
134		.	.	.	.	.	.	.	WASHER, LOCK, #8 *-----*		AN936B8		
135	A302	.	.	.	.	.	.	.	SHAFT LOCK ASSEMBLY	AK5100			
136		.	.	.	.	.	.	.	NUT, LOCK; nickel plated brass, 7/16 in. hex stock, 3/8-32 NEF-2 thread	AP15297			
137		.	.	.	.	.	.	.	BUSHING-SHAFT, PANEL; nickel plated brass, 3/8-32 NEF-2 internal thread 11/64 in. deep, 3/8-32 NEF-2 external thread 1/4 in. lg at opposite end, hex head, 4 slots 1/32 in. wide by 1/4 in. deep, over-all dim.: 1/2 in. lg by 1/2 in. across flats	AP15342			
138	R302	.	.	.	.	.	.	.	RESISTOR, VARIABLE, COMPOSITION; same as item 46			RV4NAVSD103A (MIL-R-94A)	
139	R353	.	.	.	.	.	.	.	RESISTOR, VARIABLE, COMPOSITION 10,000 ohms $\pm 10\%$ , 2 watts			RV4NAVSD105A (MIL-R-94A)	
140	R335	.	.	.	.	.	.	.	RESISTOR, VARIABLE, COMPOSITION; 1 megohm $\pm 10\%$ , 2 watts				

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)							CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Keyer Chassis - 300	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL MFG. AND CATALOG DESIGNATION (6)
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)				
141	R323	.	.	.	.	.	.	.	RESISTOR, VARIABLE, COMPOSITION; same as item 46				
142	R313	.	.	.	.	.	.	.	RESISTOR, VARIABLE, COMPOSITION; 50,000 ohms ±10%, 2 watts				
143	R317	.	.	.	.	.	.	.	RESISTOR, VARIABLE; same as item 142				
144	R307	.	.	.	.	.	.	.	RESISTOR, VARIABLE; same as item 140				
145		.	.	.	.	.	.	.	ATTACHING PARTS WASHER, LOCK; #3/8				
146		.	.	.	.	.	.	.	WASHER, LOCK; cadmium plated bronze, 3/8 in. ID, 0.692 in. OD, 0.035 in. thk *-----*	A520827		RV4NAVSD503A (MIL-R-94A)	
147		.	.	.	.	.	.	.	CLAMP, CABLE; nylon, 5/8 in. dia max size of cable accommodated	B517518			
148		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; binding head, cadmium plated steel, 6-32 NC-2 thread, 7/16 in. lg	A512447			
149		.	.	.	.	.	.	.	WASHER, LOCK; same as item 50				
150		.	.	.	.	.	.	.	WASHER, FLAT; same as item 77				
151		.	.	.	.	.	.	.	NUT, HEX; same as item 51 *-----*				
152	P301	.	.	.	.	.	.	.	CONNECTOR, PLUG, ELECTRICAL; 41 male contacts			MS24024	WTQ MRE 41H
153		.	.	.	.	.	.	.	SHIELD, ELECTRICAL CONNECTOR; aluminum, w/cable clamp, 11/16 in. dia max cable accommodated, over-all dim. excluding cable clamp: 1-17/32 in. lg by 2-5/8 in. wide by 1/2 in. deep				
154		.	.	.	.	.	.	.	GROMMET; same as item 121				
155	J305	.	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; BNC, 1 female contact				UG-1094/U (MIL-C-3608)
156	J302	.	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; same as item 155				
157	J304	.	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; same as item 155				



## Section IX

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Table 9-3

## MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radar Signal Interference Trainer (X-Band)							CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES
ITEM NO. (1)	REF SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
158	C303	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 100,000 uuf ±20%, 600 vdc	CP05A1EF104M (MIL-C-25A)	15X12	Keyer Chassis - 300
159		.	.	.	.	.	.	POST, TERMINAL; melamine body, silver plated brass terminals, over-all dim.: 9/16 in. lg by 1/4 in across flats			
160		.	.	.	.	.	.	SCREW, MACH; binding head, cadmium plated steel; 4-40 NC-2 thread 3/8 in. lg	A523203		
161		.	.	.	.	.	.	WASHER, LOCK; same as item 115 *-----*	A512424		
162	J303	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; 7 female pins, w/locking, supplied w/attaching hardware, over-all dim.: 23/32 in dia by 17/32 in. deep			WTQ M7S-LRN
163	A303	.	.	.	.	.	.	SHAFT LOCK ASSEMBLY; same as item 135			
164		.	.	.	.	.	.	NUT, LOCK; same as item 136			
165		.	.	.	.	.	.	BUSHING SHAFT, PANEL; same as item 137			
166	R358	.	.	.	.	.	.	RESISTOR, VARIABLE, COMPOSITION; 250 ohms ±10%, 2 watts		RV4NAVSD251A (MIL-R-94A)	
167		.	.	.	.	.	.	WASHER, LOCK; same as item 145			
168		.	.	.	.	.	.	WASHER, LOCK; same as item 146 *-----*			
169	R359	.	.	.	.	.	.	RESISTOR, FIXED, FILM; carbon film; hermetically sealed, 90,900 ohms, 1/2 watt, over-all body dim.: 0.640 in. lg by 0.244 in. dia			Mepco co. Inc. C-173A
170	R360	.	.	.	.	.	.	RESISTOR, FIXED, FILM; carbon film; hermetically sealed 200,000 ohms, 1/2 watt, over-all body dim.: 0.825 in. lg by 1/4 in. dia			Mepco Co. Inc. C-173B
171	R345	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 2 megohms ±5%, 1/2 watt		RC20GF205J (MIL-R-11B)	
172	C314	.	.	.	.	.	.	CAPACITOR, FIXED, CERAMIC DIELECTRIC; 10,000 uuf +100% -20%, 500 vdc		CK63Y103Z (MIL-C-11015A)	

Table 9-3

NAVEXOS P-1856

Section IX

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Keyer Chassis - 300	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)		
173	R327	.	.	.	.	.	.	.	RESISTOR, FIXED, FILM; 600,000 ohms $\pm 5\%$ , 1 watt		RN25X6003J (MIL-R-10509B)		
174	E306	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE		TS102U02 (JAN-S-28A)		
175	E303	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 174				
176	E304	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE		TS103U02 (JAN-S-28A)		
177	E305	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 174				
178	E302	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 174				
179	E301	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 174				
180	V306	.	.	.	.	.	.	.	ELECTRON TUBE		6100/6C4WA (MIL-E-1)		
181	V303	.	.	.	.	.	.	.	ELECTRON TUBE; same as item 180				
182	V304	.	.	.	.	.	.	.	ELECTRON TUBE		12AT7WA (MIL-E-1)		
183	V305	.	.	.	.	.	.	.	ELECTRON TUBE		6AU6WA (MIL-E-1)		
184	V302	.	.	.	.	.	.	.	ELECTRON TUBE; same as item 183				
185	V301	.	.	.	.	.	.	.	ELECTRON TUBE; same as item 180				
186	XV306	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; 7 pin		TS102P01 (JAN-S-28A)		
187	XV303	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
188	XV304	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; 9 pin				
189	XV305	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
190	XV302	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
191	XV301	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
192		.	.	.	.	.	.	.	STRAP, RETAINER; cadmium plated brass, two holes 4-40 NC-2 threaded on 0.875 in. centers, over-all dim.: 1-1/8 in. lg by 3/8 in. high	AK5168			
193		.	.	.	.	.	.	.	STRAP, RETAINER; cadmium plated brass, two holes 4-40 NC-2 threaded on 1-1/8 in. centers, over-all dim.: 1-11/32 in. lg by 3/8 in. high	AK5169			

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										DETAILED DESCRIPTION	CONTRACT NO. N61339-29 (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	MAJOR ASSEMBLY AND NO. SERIES Keyer Chassis - 300	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)					
194		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; binding head, cadmium plated steel, 4-40 NC-2 thread by 1/4 in. lg					
195		.	.	.	.	.	.	.	WASHER, LOCK; same as item 115 *-----*					
196		.	.	.	.	.	.	.	POST, TERMINAL; same as item 159					
197		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 160					
198		.	.	.	.	.	.	.	WASHER, LOCK; same as item 115 *-----*					
199	J316	.	.	.	.	.	.	.	JACK, TIP; low voltage			MS16108-2		
200	J307	.	.	.	.	.	.	.	JACK, TIP; same as item 199					
201	A301	.	.	.	.	.	.	.	TERMINAL BOARD ASSEMBLY		C110327			
202		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 49					
203		.	.	.	.	.	.	.	WASHER, FLAT; nickel plated brass, 0.145 in. ID, 5/16 in. OD, 1/32 in. thk					
204		.	.	.	.	.	.	.	WASHER, FLAT; same as item 77 *-----*					BBR 6480A
205	R357	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 750 ohms $\pm 5\%$ , 1 watt			RC32GF751J (MIL-R-11B)		
206	R320	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1 megohm $\pm 10\%$ , 1/2 watt			RC20GF105K (MIL-R-11B)		
207	R329	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 2.7 megohms $\pm 10\%$ , 1/2 watt			RC20GF275K (MIL-R-11B)		
208	R328	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 2.4 megohms $\pm 10\%$ , 1/2 watt			RC20GF245K (MIL-R-11B)		
209	R301	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 68,000 ohms $\pm 10\%$ , 1/2 watt			RC20GF683K (MIL-R-11B)		
210	C312	.	.	.	.	.	.	.	CAPACITOR, FIXED, CERAMIC DIELECTRIC; same as item 172					



## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO.		PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	DEVICE NO. 15X12 GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	MAJOR ASSEMBLY AND NO. SERIES Keyer Chassis -300	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)						
211	R343	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1.2 megohms ±5%, 1/2 watt	N61339-29	A512428	RC20GF125J (MIL-R-11B)	15X12	Keyer Chassis -300	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
212	R344	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 6,800 ohms ±5%, 2 watt						
213	R342	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 820,000 ±5%, 1/2 watt						
214	C311	.	.	.	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; 68 uuf ±5%, 500 vdc						
215	C309	.	.	.	.	.	.	.	CAPACITOR, VARIABLE, CERAMIC DIELECTRIC; 45 uuf max, 500 vdc						
216		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; binding head, cadmium plated steel, 4-40 NC-2 by 3/4 in. lg						
217		.	.	.	.	.	.	.	WASHER, LOCK; same as item 115						
218		.	.	.	.	.	.	.	WASHER, NONMETALIC; fibre, 0.110 in. ID, 1/4 in. OD, 1/16 in. thk						
219		.	.	.	.	.	.	.	NUT, HEX; #4-40 NC-2 thread *-----*						
220	R305	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 12,000 ohms ±10%, 1/2 watt						
221	R304	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 220	AN340-4	RC20GF123K (MIL-R-11B)	RC20GF123K (MIL-R-11B)	SHHI 2161		
222	R303	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 18,000 ohms ±10%, 1/2 watt						
223	R356	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 51,000 ohms ±10%, 2 watts						
224	R352	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 100,000 ohms ±10%, 2 watt						
225	R348	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 224						
226	R347	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 224						
227	R346	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 224						

## MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radar Signal Interference Trainer (X-Band)							CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
228	R354	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1.1 megohm $\pm 5\%$ , 1/2 watt	B116392	RC20GF115J (MIL-R-11B)	
229	R350	.	.	.	.	.	.	.	RESISTOR, FIXED, FILM; 100,000 ohms $\pm 5\%$ , 1/2 watt, over-all body dim.: 11/64 in. dia by 19/32 in. lg		RC20GF224K (MIL-R-11B)	
230	R319	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 220,000 ohms $\pm 10\%$ , 1/2 watt		RC20GF184K (MIL-R-11B)	
231	R324	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 180,000 ohms $\pm 10\%$ , 1/2 watt		RC20GF364J (MIL-R-11B)	
232	R322	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 360,000 ohms $\pm 5\%$ , 1/2 watt		RC32GF623J (MIL-R-11B)	
233	R326	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 62,000 ohms $\pm 5\%$ , 1 watt		RC42GF683K (MIL-R-11B)	
234	R314	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 68,000 ohms $\pm 10\%$ , 2 watts			
235	R325	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 231			
236	R312	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 234			
237	R337	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 47,000 ohms $\pm 10\%$ , 2 watts		RC42GF473K (MIL-R-11B)	
238	R338	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 237			
239	R316	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 20,000 ohms $\pm 5\%$ , 1/2 watt		RC20GF203J (MIL-R-11B)	
240	C308	.	.	.	.	.	.	.	CAPACITOR, FIXED, CERAMIC DIELECTRIC; same as item 172			
241	R318	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 10,000 ohms $\pm 5\%$ , 1/2 watt		RC20GF103J (MIL-R-11B)	
242	R339	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 47 ohms $\pm 5\%$ , 1/2 watt		RC20GF470J (MIL-R-11B)	
243	R308	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 82,000 ohms $\pm 10\%$ , 1/2 watt		RC20GF823K (MIL-R-11B)	

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## MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radar Signal Interference Trainer (X-Band)							CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Keyer Chassis - 300	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)		
244	R309	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 51,000 ohms $\pm$ 5%, 1/2 watt		RC20GF513J (MIL-R-11B)		
245	R310	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 244				
246	R306	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 230				
247	R336	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 100 ohms $\pm$ 10%, 1/2 watt		RC20GF101K (MIL-R-11B)		
248	R340	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 206				
249	CR302	.	.	.	.	.	.	SEMICONDUCTOR DEVICE, DIODE; germanium crystal rectifier		1N69 (MIL-E-1)		
250	CR301	.	.	.	.	.	.	SEMICONDUCTOR DEVICE, DIODE; same as item 249				
251	TB301	.	.	.	.	.	.	TERMINAL BOARD; phenolic, w/66 turret lugs, 4 electrical clips, over-all dim. 7-3/8 in. lg by 2-7/8 in. wide by 1/8 in. thk	B111758			
252	C301	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 4 uf $\pm$ 10%, 600 vdc		CP41B1FF405K (MIL-C-25A)		
253	C302	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 252				
254		.	.	.	.	.	.	BRACKET ASSEMBLY	B110305			
255		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; binding head, cadmium plated steel, 6-32 NC-2 by 3/16 in. lg	A512443			
256		.	.	.	.	.	.	WASHER, LOCK; same as item 50 *-----*				
257		.	.	.	.	.	.	CHASSIS, KEYS; aluminum, caustic etched and iridite finish, w/permanently afixed hardware, over-all dim.: 12-7/32 in. lg by 4-3/32 in. wide by 2-25/32 in. high	C110539			
258	W302	.	.	.	.	.	.	CABLE ASSEMBLY, RADIO FREQUENCY	B111986			
259	P306	.	.	.	.	.	.	CONNECTOR, PLUG, ELECTRICAL; same as item 81				
260	P312	.	.	.	.	.	.	CONNECTOR, PLUG, ELECTRICAL; UHF, (dwg no. RE49F471A)		UG-203/U		



## MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radial Signal Interference Trainer (X-Band)							CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	Klystron Tube Mount and Waveguide Assembly - 301 to 599	
261		.	.	.	.	.	.	CABLE, RADIO FREQUENCY; polyethylene dielectric, two wire, 22 AWG, copper plated steel		RG-71/U (MIL-C-17)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)	
262	10-15	.	.	.	.	.	.	KLYSTRON TUBE MOUNT and WAVEGUIDE ASSEMBLY	C107638			
263		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; binding head, cadmium plated steel, 6-32 NC-2 thread by 5/16 in. lg	A512445			
264		.	.	.	.	.	.	WASHER, LOCK; same as item 50 *-----*				
265	10-15	.	.	.	.	.	.	KLYSTRON TUBE MOUNT ASSEMBLY	C112182	AN 500-8-12		
266		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; #8-32 thread		AN935-8L		
267		.	.	.	.	.	.	WASHER, LOCK; #8		AN340-8		
268		.	.	.	.	.	.	NUT, HEX; #8-32 thread *-----*				
269	10-15	.	.	.	.	.	.	TUBE COVER ASSY	C115991		WIQ H10C	
270		.	.	.	.	.	.	SHIELD, ELECTRICAL CONNECTOR; w/cable clamp, 5/32 in. dia clamp opening, over-all dim. excluding cable clamp: 9/16 in. dia by 11/16 in. lg				
271	P405	.	.	.	.	.	.	CONNECTOR PLUG, ELECTRICAL; 4 male pins, w/lock spring, over-all dim.: 15/32 in. dia by 5/8 in. deep			WIQ M4P-LS	
272	HR401	.	.	.	.	.	.	HEATER, SPACE, ELECTRIC; 115v, 50 watts, over-all dim. excluding leads: 3/8 in. dia by 1-1/2 in. lg	B115985			
273		.	.	.	.	.	.	CLIP, CARTRIDGE; cadmium plated steel, over-all dim.: 1.187 in. lg by 0.425 in. wide by 0.490 in. high			AAEP 6002-1A	
274		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 160				
275		.	.	.	.	.	.	WASHER, LOCK; cadmium plated spring steel, split type, over-all dim.: 0.212 in. dia OD by 0.112 in. ID by 0.025 in. thk	A515902			

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## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)							CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES Klystron Tube Mount and Waveguide Assembly - 301 to 599	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	
276		.	.	.	.	.	.	.	WASHER, FLAT; cadmium plated steel, 0.149 in. ID, 0.375 in. OD, 0.016 in. thk	A503603	
277		.	.	.	.	.	.	.	NUT, HEX; cadmium plated steel 4-40 NC-2 thread *-----*	A502823	
278	S403	.	.	.	.	.	.	.	SWITCH, THERMOSTATIC; 5 amp, -60 deg C to +100 deg C range, over-all dim.: 1-1/4 in. lg by 3/4 in. wide by 7/16 in. high		ULC 13
279		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; binding head, cadmium plated steel, 4-40 NC-2 thread by 7/8 in. lg	A512429	
280		.	.	.	.	.	.	.	WASHER, LOCK; same as item 275		
281		.	.	.	.	.	.	.	WASHER, FLAT; same as item 276		
282		.	.	.	.	.	.	.	NUT, HEX; same as item 277 *-----*		
283		.	.	.	.	.	.	.	POST, MOUNTING; 2024-T4 aluminum, anodized finish, over-all dim.: 3/16 in. dia by 5/8 in. lg, w/0.110 in. dia thru hole	B115986	
284		.	.	.	.	.	.	.	POST, TERMINAL; nickel plated brass, ceramic insulation, over-all dim.: 5/16 in. dia by 25/32 in. lg		CGT X-1942-X
285		.	.	.	.	.	.	.	ATTACHING PARTS WASHER, FLAT; same as item 276		
286		.	.	.	.	.	.	.	NUT, HEX; cadmium plated steel, 6-32 NC-2 thread *-----*	A502825	
287		.	.	.	.	.	.	.	GROMMET; natural rubber, over-all dim.: 1/4 in. ID by 7/16 in. OD by 3/8 in. thk		MRQ U2463
288	N401	.	.	.	.	.	.	.	PLATE, INSTRUCTION; red and yellow letters w/black enamel background, inscribed "WARNING HIGH TEMPERATURE", over-all dim.: 2 in. lg by 1 in. high by 1/16 in. thk	B116741	
289		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; cadmium plated steel, 4-40 NC-2 thread 5/16 in. lg	A512423	

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Klystron Tube Mount and Waveguide Assembly - 301 to 599	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)	
290		.	.	.	.	.	.	.	WASHER, LOCK; cadmium plated steel, 0.116 in. ID, 0.270 in. OD, 0.016 in. thk	A520803			
291		.	.	.	.	.	.	.	WASHER, FLAT; same as item 276				
292		.	.	.	.	.	.	.	NUT, HEX; same as item 277 *-----*				
293		.	.	.	.	.	.	.	INSULATION, BLANKET, THERMAL; bonded white fiber, over-all dim.: 8 in. lg by 3-1/32 in. wide by 0.20 thk	C115990			
294		.	.	.	.	.	.	.	COVER, TUBE; cadmium plated steel, over-all dim.: 3-3/32 in. dia by 3-3/4 in. high w/clamping device attached	B111738		WIQ H19C	
295	P302	.	.	.	.	.	.	.	CONNECTOR PLUG, ELECTRICAL; same as item 81				
296		.	.	.	.	.	.	.	SHIELD, ELECTRICAL CONNECTOR; w/cable clamp, 19/64 in. dia cable opening, over-all dim.: 21/32 in. dia by 21/32 in. lg excluding clamp				
297	P303	.	.	.	.	.	.	.	CONNECTOR, PLUG, ELECTRICAL; 7 male pins, w/lock spring, over-all dim.: 25/32 in. dia by 17/32 in. deep			WIQ M7P-LS	
298		.	.	.	.	.	.	.	CLAMP, RIM CLENCHING; nylon, over-all dim.: 1/2 in. dia by 43/64 in. lg	B111742			
299		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, SELF-LOCKING; cadmium plated steel, 4-40 NC-2 thread, 7/8 in. lg *-----*			FLN M36BS440-14CR	
300	V307	.	.	.	.	.	.	.	ELECTRON TUBE		2K45 (MIL-E-1)		
301	XV307	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; 8 female pins, modified from AMP part no. 78-S8 by drilling an 0.156 in. dia hole thru the #4 pin	B116396			
302		.	.	.	.	.	.	.	PLATE, TUBE MOUNTING; silver plated brass, over-all dim.: 3.046 in. dia by 0.091 in. thk	B116407			
303		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; #2-56 thread		AN500A2-5		



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MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radar Signal Interference Trainer (X-Band)							CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Klystron Tube Mount and Waveguide Assembly - 301 to 599	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
ITEM (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)		
304		.	.	.	.	.	.	WASHER, LOCK; #2 *-----*		AN935-2		
305		.	.	.	.	.	.	PIN, STRAIGHT, HEADLESS; stainless steel, over-all dim.: 0.62 in. dia by 1/4 in. lg				AG 52-012-062-0250
306		.	.	.	.	.	.	GROMMET; rubber			AN931A7-II (MIL-G-3036)	
307		.	.	.	.	.	.	INSULATOR, THERMAL; <b>arc</b> resistant plastic, bowl shape, over-all dim.: 31/32 in. dia by 0.225 in. high	B111735			
308	E311	.	.	.	.	.	.	COVER, CHOKE; brass, over-all dim.: 27/32 in. dia by 0.195 in. high	B111744			
309	E312	.	.	.	.	.	.	INSULATOR, RADIO FREQUENCY; T shaped plastic, over-all dim.: 0.734 in. dia by 21/64 in. lg	B111736			
310		.	.	.	.	.	.	HOUSING, KLYSTRON TUBE MOUNT; caustic etch and iridited aluminum alloy, over-all dim.: 4-1/8 in. lg by 2 in. high	D111746			
311	CR501	.	.	.	.	.	.	SEMICONDUCTOR DEVICE, DIODE		1N23C (MIL-E-1)		
312	XCR501	.	.	.	.	.	.	CRYSTAL HOLDER, COAXIAL; incorporates type N input connector (Ref Symbol J312) and output connector (Ref Symbol P311) (Sig Corps dwg no. SC-D-12024D)		UG-119/UP		
313	10-15	.	.	.	.	.	.	WAVEGUIDE ASSEMBLY	B107626			
314	A305	.	.	.	.	.	.	CONNECTOR ASSEMBLY	B107624			
315	J311	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; modi- fied UG-58/U by turning down flange to 0.875 in. dia and cutting probe 0.042 in. lg then silver plating cut portions	B107623			
316		.	.	.	.	.	.	RETAINER, CONNECTOR; 2024-T4 aluminum, over-all dim.: 1-1/4 in. by 1-1/4 in.	A107625			
317		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; #4-40 thread			AN515C4-4	
318		.	.	.	.	.	.	WASHER, SPLIT; same as item 275 *-----*				

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)							CONTRACT NO. N61339-29	PRIME CONTRACTOR'S DRAWING NO. (PART NO.)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	MAJOR ASSEMBLY AND NO. SERIES Audio Amplifier Chassis - 100	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5 6 7 PART NAME AND DESCRIPTION (3)					
319	J310	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; same as item 17					
320		.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 317					
321		.	.	.	.	WASHER, SPLIT; same as item 275 *-----*					
322	W305	.	.	.	.	WAVEGUIDE; 356-T6 aluminum, over-all dim.: 4-5/16 in. lg by 1-5/8 in. wide by 1-5/8 in. high	B116408				
323	10-10	.	.	.	.	AUDIO AMPLIFIER CHASSIS	D109800				
324		.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 133					
325		.	.	.	.	WASHER, LOCK; same as item 134 *-----*					
326	A101	.	.	.	.	TERMINAL BOARD ASSEMBLY	B109806				
327		.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 49					
328		.	.	.	.	WASHER, LOCK; same as item 50					
329		.	.	.	.	WASHER, FLAT; same as item 77 *-----*					
330	R103	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 75,000 ohms $\pm 10\%$ , 1/2 watt			RC20GF753K (MIL-R-11B)		
331	R104	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 270 ohms $\pm 10\%$ , 1 watt			RC32GF271K (MIL-R-11B)		
332	C104	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; 100 uuf $\pm 10\%$ , 500 vdc			CM20B101K (MIL-C-5A)		
333	R105	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 330					
334	R106	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 22,000 ohms $\pm 10\%$ , 1/2 watt			RC20GF223K (MIL-R-11B)		
335	R107	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 180 ohms $\pm 10\%$ , 2 watts			RC42GF181K (MIL-R-11B)		

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## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)							CONTRACT NO.		PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	MAJOR ASSEMBLY AND NO. SERIES Audio Amplifier Chassis - 100	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7			DEVICE NO. 15X12	COMMERCIAL M' FGR. AND CATALOG DESIGNATION (6)
336	C107	.	.	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; 10,000 uuf ±10%, 300 vdc		CM35B103K (MIL-C-5A)		
337	R108	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 47,000 ohms ±10%, 1/2 watt		RC20GF473K (MIL-R-11B)		
338	R109	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 10,000 ohms ±10%, 2 watts		RC42GF103K (MIL-R-11B)		
339	R111	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 331				
340	CR101	.	.	.	.	.	.	SEMICONDUCTOR DEVICE, DIODE		1N126 (MIL-E-1)		
341	C108	.	.	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; same as item 332				
342	TB102	.	.	.	.	.	.	TERMINAL BOARD; phenolic, w/28 turret lugs, over- all dim. 6-13/16 in. lg by 1-3/4 in. wide by 1/8 in. thk	B109807			
343	R110	.	.	.	.	.	.	RESISTOR, FIXED, WIREWOUND; 10 ohms, 15 watts		RW20G392 (MIL-R-26)		
344		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; binding head, cadmium plated steel, 6-32 NC-2 thread by 3/4 in. lg	A512450			
345		.	.	.	.	.	.	WASHER, FLAT; same as item 77				
346		.	.	.	.	.	.	WASHER, LOCK; same as item 50				
347		.	.	.	.	.	.	NUT, HEX; same as item 51 *-----*				
348	A102	.	.	.	.	.	.	TERMINAL BOARD ASSEMBLY	B111749			
349		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 49				
350		.	.	.	.	.	.	WASHER, LOCK; same as item 50				
351		.	.	.	.	.	.	WASHER, FLAT; same as item 77 *-----*				
352	C101	.	.	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; 100 uuf ±5%, 500 vdc		CM20B101J (MIL-C-5A)		



## MAJOR ASSEMBLY PARTS LIST

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	Radial Signal Interference Trainer (X-Band)							CONTRACT NO. N61339-29 (4)	DEVICE NO. 15X12 (5)	MAJOR ASSEMBLY AND NO. SERIES Audio Amplifier Chassis - 100 (6)	
		1	2	3	4	5	6	7			GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL MFG. AND CATALOG DESIGNATION (6)
353	R101	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 334	B111988	RC20GF154J (MIL-R-11B)	WIQ MRE 14H	
354	R102	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 150,000 ohms $\pm 5\%$ , 1/2 watt				
355	TB101	.	.	.	.	.	.	TERMINAL BOARD; phenolic, w/12 turret lugs, over-all dim.: 3 in. lg by 1-3/4 in. wide by 1/8 in. thk				
356	P101	.	.	.	.	.	.	CONNECTOR, PLUG, ELECTRICAL; 14 male contacts				
357		.	.	.	.	.	.	SHIELD, ELECTRICAL CONNECTOR; aluminum, w/cable clamp, 7/16 in. dia max cable accommodated, over-all dim. excluding cable clamp: 1-1/32 in. lg by 1-1/4 in. wide by 7/16 in. deep				
358		.	.	.	.	.	.	GROMMET; rubber, 3/8 in. ID				
359	E103	.	.	.	.	.	.	SHIELD, ELECTRON TUBE				
360	E102	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 359				
361	E101	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 359				
362	V103	.	.	.	.	.	.	ELECTRON TUBE				
363	V102	.	.	.	.	.	.	ELECTRON TUBE; same as item 183	TS102U03 (JAN-S-28A)	AN931-6-10 (MIL-G-3036)		
364	V101	.	.	.	.	.	.	ELECTRON TUBE; same as item 183				
365	XV103	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
366	SV102	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
367	XV101	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
368		.	.	.	.	.	.	STRAP, RETAINING; same as item 192				
369		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 289				
370		.	.	.	.	.	.	WASHER, LOCK; same as item 115 *-----*				
371		.	.	.	.	.	.	CLAMP, CABLE; 1/2 in. dia max cable accommodated	B517516			

Table 9-3

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Section IX

## MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radar Signal Interference Trainer (X-Band)							CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	Audio Amplifier Chassis - 100	
											COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)	
372		.	.	.	.	.	.	SCREW, MACH; binding hd, cadmium plated steel, 6-32 NC-2 thread, 7/16 in. lg	A512347			
373		.	.	.	.	.	.	WASHER, LOCK; same as item 50				
374		.	.	.	.	.	.	WASHER, FLAT; same as item 77				
375		.	.	.	.	.	.	NUT, HEX; same as item 51 *-----*				
376	C110	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 500,000 uuf ±10%, 600 vdc		CP55B1EF504K (MIL-C-25A)		
377		.	.	.	.	.	.	SCREW, MACH; same as item 133				
378		.	.	.	.	.	.	WASHER, LOCK; same as item 134				
379		.	.	.	.	.	.	NUT, HEX; same as item 268 *-----*				
380	C106	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 100,000 uuf ±10%, 300 vdc		CP11A1EF104K (MIL-C-25A)		
381	C193	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 380				
382	C109	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 100,000 uuf ±10%, 600 vdc		CP05A1EF104K (MIL-C-25A)		
383	C105	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 382				
384	C102	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 10,000 uuf ±10%, 600 vdc		CP09A1EF103K (MIL-C-25A)		
385		.	.	.	.	.	.	POST, TERMINAL; asbestos filled melamine, one 6-32 thread insert, over-all dim.: 23/32 in. high by 1/4 in. dia				WIQ 773
386		.	.	.	.	.	.	SCREW, MACH; binding hd, cadmium plated steel, 6-32 NC-2 thread 1/4 in. lg	A512444			
387		.	.	.	.	.	.	WASHER, LOCK; same as item 50 *-----*				

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO. N61339-29 (PART NO.) (4)	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Modulator Chassis - 200	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)					
388		.	.	.	.	.	.	.	CHASSIS, AUDIO AMPLIFIER; aluminum, over-all dim.: 6-3/16 in. lg by 3-9/16 in. wide by 3 in. high	C109801				
389	10-7	.	.	.	.	.	.	.	MODULATOR CHASSIS	D110098				
390		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 133					
391		.	.	.	.	.	.	.	WASHER, LOCK; same as item 134 *-----*					
392	A201	.	.	.	.	.	.	.	MAGNET ASSEMBLY (with attaching hardware)	B111026				ZE 333
393		.	.	.	.	.	.	.	TERMINAL, LUG; brass, hot tin dipped, 45° angle of bend, over-all dim.: 7/16 in. lg by 7/32 in. wide, by 1/32 in. thk					
394		.	.	.	.	.	.	.	ATTACHING PARTS NUT, HEX; same as item 115 *-----*					
395	V201	.	.	.	.	.	.	.	ELECTRON TUBE				6D4 (MIL-E-1)	
396	E202	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 174					
397	E203	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 176					
398	E205	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 174					
399	E204	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 176					
400	V202	.	.	.	.	.	.	.	ELECTRON TUBE; same as item 183					
401	V203	.	.	.	.	.	.	.	ELECTRON TUBE					
402	V205	.	.	.	.	.	.	.	ELECTRON TUBE; same as item 183					
403	V204	.	.	.	.	.	.	.	ELECTRON TUBE; same as item 182					
404	XV202	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				5814A (MIL-E-1)	
405	XV203	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 188					
406	XV205	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186					
407	XV204	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 188					



Table 9-3

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Section IX

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)							CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Modulator Chassis - 200	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5 6 7			GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
408		.	.	.	.	STRAP, RETAINING; same as item 192				
409		.	.	.	.	STRAP, RETAINING; same as item 193				
410		.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 194				
411		.	.	.	.	WASHER, LOCK; same as item 115 *-----*				
412	C202	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 0.10 uf $\pm 20\%$ , 600 vdc			CP10A1EF104M	
413		.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 263				
414		.	.	.	.	WASHER, LOCK; same as item 50				
415		.	.	.	.	NUT, HEX; same as item 51 *-----*				
416	C205	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 0.1 uf, $\pm 20\%$ , 400 vdc			CP11A3EE104M (MIL -C-25A)	
417	C203	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 1.0 uf, $\pm 20\%$ , 100 vdc			CP11A3EB105M (MIL -C-25A)	
418	C204	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 412				
419		.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 263				
420		.	.	.	.	WASHER, LOCK; same as item 50				
421		.	.	.	.	NUT, HEX; same as item 51 *-----*				
422	C201	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 0.25 uf $\pm 20\%$ , 600 vdc			CP61B1EF254M (MIL -C-25A)	
423		.	.	.	.	BRACKET, CAPACITOR; 1.563 in. high by 0.7660 in. deep, spade type bracket			CP06SA3 (MIL -C-25A)	
424		.	.	.	.	ATTACHING PARTS WASHER, LOCK; same as item 50				

## MAJOR ASSEMBLY PARTS LIST

MAJOR ASSEMBLY PARTS LIST									
DEVICE NAME		Radar Signal Interference Trainer (X-Band)					CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)
425		.	.	.	NUT, HEX; same as item 51	*	*-----*		
426	K201	.	.	.	RELAY, ARMATURE; 10,000 ohms $\pm 8\%$ , 5.75 ma rated current, 57.5 vdc, contact pull in voltage 36 to 46 vdc, contacts drop out below 28 vdc, 2-7/16 in. high by 1-5/8 in. wide				
427		.	.	.	WASHER, LOCK; same as item 50				ATTACHING PARTS
428		.	.	.	NUT, HEX; same as item 51	*	*-----*		
429	C212	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 0.05 uf $\pm 10\%$ , 600 vdc				
430		.	.	.	BRACKET, CAPACITOR; 1 in. high by 0.766 in. deep, spade type bracket				
431		.	.	.	WASHER, LOCK; same as item 50				ATTACHING PARTS
432		.	.	.	NUT, HEX; same as item 51	*	*-----*		
433	C215	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; 4700 uuf $\pm 10\%$ , 500 vdc				
434		.	.	.	POST, TERMINAL; same as item 159				
435		.	.	.	SCREW, MACH; same as item 194				ATTACHING PARTS
436		.	.	.	WASHER, LOCK; same as item 115	*	*-----*		
437	J204	.	.	.	JACK, TIP; same as item 199				
438	J205	.	.	.	JACK, TIP; same as item 199				
439	J206	.	.	.	JACK, TIP; same as item 199				
440	J207	.	.	.	JACK, TIP; same as item 199				
441	J208	.	.	.	JACK, TIP; same as item 199				

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Section IX

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
442	R244	.	.	.	.	.	.	.	RESISTOR, FIXED, WIREWOUND; power type, 5,000 ohms ±3%		RH50G502H (MIL-R-18546B)	
443		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 160			
444		.	.	.	.	.	.	.	WASHER, LOCK; same as item 115			
445		.	.	.	.	.	.	.	WASHER, FLAT; cadmium plated steel, 0.125 in. ID, 0.312 in. OD, 0.016 in. thk	A503602		
446		.	.	.	.	.	.	.	NUT, HEX; same as item 219 *-----*			
447		.	.	.	.	.	.	.	SHIELD, ELECTRICAL CONNECTOR; aluminum, w/21/32 in. dia cable clamp, over-all dim.: 2 in. lg by 2 in. wide by 53/64 in. deep			WIQ MRE 34H
448	P201	.	.	.	.	.	.	.	CONNECTOR, PLUG, ELECTRICAL; 34 male contacts			
449		.	.	.	.	.	.	.	CLAMP, CABLE; same as item 147			
450		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; binding hd, #8-32 by 7/16 in. lg	A512462		
451		.	.	.	.	.	.	.	WASHER, LOCK; same as item 134			
452		.	.	.	.	.	.	.	WASHER, FLAT; cadmium plated steel, 0.174 in. ID, 0.375 in. OD, 0.016 in. thk	A503604		
453		.	.	.	.	.	.	.	NUT, HEX; same as item 268 *-----*			
454		.	.	.	.	.	.	.	GROMMET; same as item 121			
455		.	.	.	.	.	.	.	POST, TERMINAL; same as item 159			
456		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 194			
457		.	.	.	.	.	.	.	WASHER, LOCK; same as item 115 *-----*			
458	E206	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 174			
459	E207	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 359			



## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Modulator Chassis - 200	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)			GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL MFG. AND CATALOG DESIGNATION (6)
460	E208	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 176				
461	E210	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 176				
462	E209	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 359				
463	E211	.	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 174				
464	V206	.	.	.	.	.	.	.	ELECTRON TUBE			6AH6 (MIL-E-1)	
465	V207	.	.	.	.	.	.	.	ELECTRON TUBE; same as item 362				
466	V208	.	.	.	.	.	.	.	ELECTRON TUBE; same as item 401				
467	V210	.	.	.	.	.	.	.	ELECTRON TUBE; same as item 401				
468	V209	.	.	.	.	.	.	.	ELECTRON TUBE			0A2WA (MIL-E-1)	
469	V211	.	.	.	.	.	.	.	ELECTRON TUBE; same as item 180				
470	XV206	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
471	XV207	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
472	XV208	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 188				
473	XV210	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 188				
474	XV209	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
475	XV211	.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				
476		.	.	.	.	.	.	.	STRAP, RETAINING; same as item 192				
477		.	.	.	.	.	.	.	STRAP, RETAINING; same as item 193				
478		.	.	.	.	.	.	.	ATTACHING PARTS				
479		.	.	.	.	.	.	.	SCREW, MACH; same as item 194				
		.	.	.	.	.	.	.	WASHER, LOCK; same as item 115				
		.	.	.	.	.	.	.	*-----*				
480	C210	.	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 422				
481		.	.	.	.	.	.	.	BRACKET, CAPACITOR; same as item 423				

## MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radar Signal Interference Trainer (X-Band)							CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Modulator Chassis - 200	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)		
482		.	.	.	.	.	.	.				
483		.	.	.	.	.	.	.				
484	J202	.	.	.	.	.	.	.				
485	C211	.	.	.	.	.	.	.				
486		.	.	.	.	.	.	.				
487		.	.	.	.	.	.	.				
488		.	.	.	.	.	.	.				
489	A202	.	.	.	.	.	.	.				
490		.	.	.	.	.	.	.				
491		.	.	.	.	.	.	.				
492	R250	.	.	.	.	.	.	.				
493	R227	.	.	.	.	.	.	.				
494	R218	.	.	.	.	.	.	.				
495	J203	.	.	.	.	.	.	.				
496	C220	.	.	.	.	.	.	.				
497		.	.	.	.	.	.	.				

## MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radar Signal Interference Trainer (X-Band)							CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)	
498								ATTACHING PARTS				
499								WASHER, LOCK; same as item 50				
								NUT, HEX; same as item 51				
								*-----*				
500	C216							CAPACITOR, FIXED, PAPER DIELECTRIC; 100,000 uuf ±10%, 600 vdc		CP11A3EF104K (MIL -C-25A)		
501	C219							CAPACITOR, FIXED, MICA DIELECTRIC; 47 uuf ±10%, 500 vdc		CM20B470K (MIL -C-5A)		
502	R272							RESISTOR, FIXED, COMPOSITION; 3300 ohms ±10%, 1/2 watt		RC20GF332K (MIL -R-11B)		
503	R221							RESISTOR, FIXED, COMPOSITION; 130,000 ohms ±5%, 1/2 watt		RC20GF134J (MIL -R-11B)		
504	C221							CAPACITOR, FIXED, CERAMIC DIELECTRIC; same as item 172				
505	A203							TERMINAL BOARD ASSEMBLY	D110094			
506								ATTACHING PARTS				
507								SCREW, MACH; same as item 263				
508								WASHER, LOCK; same as item 50				
								WASHER, FLAT; same as item 77				
								*-----*				
509	R239							RESISTOR, FIXED, COMPOSITION; 680 ohms ±5%, 1/2 watt		RC20GF681J (MIL -R-11B)		
510	R245							RESISTOR, FIXED, COMPOSITION; 470 ohm ±5%, 1 watt		RC32GF471J (MIL -R-11B)		
511	R203							RESISTOR, FIXED, COMPOSITION; 3300 ohms ±10%, 2 watts		RC42GF332K (MIL -R-11B)		
512	R204							RESISTOR, FIXED, COMPOSITION; 6800 ohms ±10%, 2 watts		RC42GF682K (MIL -R-11B)		
513	R205							RESISTOR, FIXED, COMPOSITION; same as item 512				
514	R202							RESISTOR, FIXED, COMPOSITION; same as item 511				



Radar Signal Interference Trainer (X-Band)										CONTRACT NO. N61339-29		DEVICE NO. 15X12		MAJOR ASSEMBLY AND NO. SERIES Modulator Chassis - 200			
ITEM NO. (1)		REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)		PART NAME AND DESCRIPTION (3)							PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)		GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)		COMMERCIAL M'FR. AND CATALOG DESIGNATION (6)		
515	R201	. . . .	. . . .	1	2	3	4	5	6	7	RESISTOR, FIXED, COMPOSITION; 8200 ohms $\pm 10\%$ , 2 watts					RC42GF822K (MIL-R-11B)	
516	R207	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 22,000 ohms $\pm 10\%$ , 1 watt					RC32GF223K (MIL-R-11B)	
517	C209	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	CAPACITOR, FIXED, MICA DIELECTRIC; 150 uuf $\pm 5\%$ , 500 vdc					CM20B151J (MIL-C-5A)	
518	R210	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 62,000 ohms $\pm 5\%$ , 1/2 watt					RC20GF623J (MIL-R-11B)	
519	R209	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 82,000 ohms $\pm 10\%$ , 1 watt					RC32GF823K (MIL-R-11B)	
520	R243	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 470,000 ohms $\pm 10\%$ , 1/2 watt					RC20GF474K (MIL-R-11B)	
521	R242	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; same as item 337						
522	R240	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; same as item 519						
523	R248	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 2.2 megohms $\pm 10\%$ , 1/2 watt						
524	R274	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 560,000 ohms $\pm 10\%$ , 1/2 watt					RC20GF225K (MIL-R-11B)	
525	R238	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 47,000 ohms $\pm 10\%$ , 1 watt					RC20GF564K (MIL-R-11B)	
526	R246	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 18,000 ohms $\pm 10\%$ , 2 watts					RC32GF473K (MIL-R-11B)	
527	R249	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 820,000 ohms $\pm 10\%$ , 1/2 watt					RC42GF183K (MIL-R-11B)	
528	R208	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 560 ohms $\pm 5\%$ , 1/2 watt					RC20GF824K (MIL-R-11B)	
529	R261	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; 470 ohms $\pm 5\%$ , 1/2 watt					RC20GF561J (MIL-R-11B)	
530	R206	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	RESISTOR, FIXED, COMPOSITION; same as item 337					RC20GF471J (MIL-R-11B)	

## MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radar Signal Interference Trainer (X-Band)							CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
531	R260	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 10,000 ohms $\pm 5\%$ , 2 watts	N61339-29	15X12	Modulator Chassis - 200
532	R228	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 128			
533	R215	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 430,000 ohms $\pm 5\%$ , 1/2 watt			
534	R212	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 128			
535	RT237	.	.	.	.	.	.	RESISTOR, THERMAL; fiber cartridge, cold resistance: 60,500 ohms $\pm 29\%$ , over-all dim.: 1-5/16 in. lg by 17/64 in. wide	N61339-29	RC42GF103J (MIL-R-11B)	VIEC 46A1
536		.	.	.	.	.	.	CLIP, ELECTRICAL; nickel plated brass, over-all dim.: 7/16 in. high by 3/8 in. wide by 17/64 in. deep			
537		.	.	.	.	.	.	TERMINAL, LUG; same as item 393			
538		.	.	.	.	.	.	ATTACHING PARTS			
539		.	.	.	.	.	.	SCREW, MACH; same as item 160	N61339-29	RC20GF434J (MIL-R-11B)	ZE 106
540		.	.	.	.	.	.	WASHER, LOCK; same as item 115			
541		.	.	.	.	.	.	WASHER, FLAT; same as item 445			
542	R247	.	.	.	.	.	.	NUT, HEX; same as item 219			
543	R213	.	.	.	.	.	.	*-----*	RC20GF222K (MIL-R-11B)	RC20GF222K (MIL-R-11B)	RC20GF222K (MIL-R-11B)
544	R254	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 502			
545	R217	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 2200 ohms $\pm 10\%$ , 1/2 watt			
546	R223	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 531			
547	R224	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 270,000 ohms $\pm 10\%$ , 1/2 watt	RC20GF274K (MIL-R-11B)	RC20GF274K (MIL-R-11B)	RC20GF274K (MIL-R-11B)
548	R225	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 510,000 ohms $\pm 5\%$ , 1/2 watt			
		.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 51,000 ohms $\pm 5\%$ , 2 watts			
		.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 547			

Table 9-3

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Section IX

## MAJOR ASSEMBLY PARTS LIST

RADAR SIGNAL INTERFERENCE TRAINER (X-BAND)														
DEVICE NAME		PART NAME AND DESCRIPTION (3)							CONTRACT NO. N61339-29		DEVICE NO. 15X12		MAJOR ASSEMBLY AND NO. SERIES Modulator Chassis - 200	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FRG. AND CATALOG DESIGNATION (6)			
549	C214	.	.	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; 30 uuf ±5%, 500 vdc		CM20B300J (MIL-C-5A)				
550	R259	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 4,700 ohms ±10%, 1/2 watt		RC20GF472K (MIL-R-11B)				
551	C224	.	.	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; 820 uuf ±10%, 500 vdc		CM30B821K (MIL-C-5A)				
552	R257	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 2000 ohms ±5%, 2 watts		RC42GF202J (MIL-R-11B)				
553	R256	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 3600 ohms ±5%, 2 watts		RC42GF362J (MIL-R-11B)				
554	R255	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1600 ohms ±5%, 2 watts		RC42GF162J (MIL-R-11B)				
555	R270	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 68,000 ohms ±5%, 1/2 watt		RC20GF683J (MIL-R-11B)				
556	R269	.	.	.	.	.	.	RESISTOR, FIXED, WIREWOUND; 10,000 ±10%, 5 watts, 400 vdc, over-all body dim.: 7/8 in. lg by 5/16 in. dia			DABU RS-5			
557	R264	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 3300 ohms ±5%, 2 watts						
558	C218	.	.	.	.	.	.	CAPACITOR, VARIABLE, CERAMIC DIELECTRIC; 3 uuf min, 12 uuf max, 500 vdc						
559	C217	.	.	.	.	.	.	CAPACITOR, VARIABLE, CERAMIC DIELECTRIC; same as item 215						
560		.	.	.	.	.	.	ATTACHING PARTS						
		.	.	.	.	.	.	SCREW, MACH; same as item 216						
561		.	.	.	.	.	.	WASHER, FLAT; same as item 218						
562		.	.	.	.	.	.	NUT, HEX; same as item 219						
		.	.	.	.	.	.	*-----*						
563	R266	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 557						
564	R265	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 557						



## MAJOR ASSEMBLY PARTS LIST

MAJOR ASSEMBLY PARTS LIST									
Radar Signal Interference Trainer (X-Band)									
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)
565	CR201	.	.	.	.	.	.	.	SEMICONDUCTOR DEVICE, DIODE; same as item 249
566	R232	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1,000 ohms $\pm 5\%$ , 1/2 watt
567	R267	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 110,000 ohms $\pm 5\%$ , 1/2 watt
568	R263	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1.8 megohms $\pm 5\%$ , 1/2 watt
569	R262	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 220,000 ohms $\pm 5\%$ , 1/2 watt
570	R235	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 12,000 ohms $\pm 5\%$ , 1/2 watt
571	R226	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 43,000 ohms $\pm 5\%$ , 1/2 watt
572	R258	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 330,000 ohms $\pm 5\%$ , 1/2 watt
573	R216	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1.6 megohms $\pm 5\%$ , 1/2 watt
574	C213	.	.	.	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; same as item 352
575	R252	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 4700 ohms $\pm 5\%$ , 2 watts
576	R253	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 354
577	R222	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 230
578	R273	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 502
579	R268	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1500 ohms $\pm 5\%$ , 1/2 watt
580	C223	.	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 22,000 uuf $\pm 10\%$ , 600 vdc
581	R236	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 5100 ohms $\pm 5\%$ , 1/2 watt
									RC20GF102J (MIL-R-11B)
									RC20GF114J (MIL-R-11B)
									RC20GF185J (MIL-R-11B)
									RC20GF224J (MIL-R-11B)
									RC20GF123J (MIL-R-11B)
									RC20GF433J (MIL-R-11B)
									RC20GF334J (MIL-R-11B)
									RC20GF165J (MIL-R-11B)
									RC42GF472J (MIL-R-11B)
									RC20GF152J (MIL-R-11B)
									CP05A1KF223K (MIL-C-25A)
									RC20GF512J (MIL-R-11B)

## MAJOR ASSEMBLY PARTS LIST

MAJOR ASSEMBLY PARTS LIST									
Radar Signal Interference Trainer (X-Band)									
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)
582	C207	.	.	.	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; 9100 uuf ±5%, 300 vdc
583	R219	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 120,000 ohms ±10%, 1/2 watt
584	C208	.	.	.	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; same as item 582
585	C206	.	.	.	.	.	.	.	CAPACITOR, FIXED, MICA DIELECTRIC; same as item 517
586	R233	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 570
587	R234	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 566
588	R229	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 581
589	TB201	.	.	.	.	.	.	.	TERMINAL BOARD; phenolic, w/103 turret lugs, 2 electrical clips, over-all dim.: 9-3/8 in. lg by 4-3/16 in. wide by 1/8 in. thk
590		.	.	.	.	.	.	.	CHASSIS, MODULATOR; aluminum, caustic etched and iridite finish, over-all dim.: 10.031 in. lg by 7-15/32 in. wide by 2-13/16 in. deep
591	10-12	.	.	.	.	.	.	.	POWER SUPPLY CHASSIS
592		.	.	.	.	.	.	.	ATTACHING PARTS
593		.	.	.	.	.	.	.	SCREW, MACH; 6-32 thread
		.	.	.	.	.	.	.	SCREW, MACH; 6-32 thread
		.	.	.	.	.	.	.	*-----*
594	C412	.	.	.	.	.	.	.	CAPACITOR, FIXED, ELECTROLYTIC; DC, 50 uf, 400 vdcw
595	C413	.	.	.	.	.	.	.	CAPACITOR, FIXED, ELECTROLYTIC; same as item 594
596	C401	.	.	.	.	.	.	.	CAPACITOR, FIXED, ELECTROLYTIC; 25 uf, 400 vdc
597	C407	.	.	.	.	.	.	.	CAPACITOR, FIXED, ELECTROLYTIC; same as item 596
598	C408	.	.	.	.	.	.	.	CAPACITOR, FIXED, ELECTROLYTIC; 10 uf, 400 vdc

DEVICE NO.

15X12

CONTRACT NO.

N61339-29

PRIME CONTRACTOR'S DRAWING NO. (PART NO.)

(4)

GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)

(5)

COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)

(6)

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Power Supply Chassis - 400
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
599	C403	.	.	.	.	.	.	.	CAPACITOR, FIXED, ELECTROLYTIC; same as item 598	B111137		
600	T402	.	.	.	.	.	.	.	TRANSFORMER, POWER, STEP-DOWN; primary data: 115v, 50 to 440 cps, secondary data: 6.4v ac all windings, meets requirements of Spec MIL-T-27A type TFI SXOIGA, over-all dim. excluding mtg studs: 2-3/4 in. wide by 2-3/8 in. deep by 4 in. high			
601		.	.	.	.	.	.	.	ATTACHING PARTS			
602		.	.	.	.	.	.	.	WASHER, LOCK; same as item 50			
603		.	.	.	.	.	.	.	NUT, HEX; same as item 51			
604		.	.	.	.	.	.	.	*-----*			
605	V401	.	.	.	.	.	.	.	RETAINER, ELECTRON TUBE; stainless steel, passivate finish, over-all dim.: 1-7/8 in. ID by 2-7/16 in. OD			TTE 15Y
606	XV401	.	.	.	.	.	.	.	STUD, PLAIN; stainless steel, passivate finish, 8-32 thread, supplied w/attaching hardware, over-all dim.: 4-1/4 in. lg			TTE 42
607		.	.	.	.	.	.	.	ELECTRON TUBE			5R4WGA (MIL-E-1)
608		.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; 8 pin			TS101P01 (JAN-S-28A)
609		.	.	.	.	.	.	.	ATTACHING PARTS			
610		.	.	.	.	.	.	.	SCREW, MACH; same as item 49			
611		.	.	.	.	.	.	.	NUT, HEX; same as item 51			
612	V406	.	.	.	.	.	.	.	WASHER, LOCK; same as item 50			
613	V402	.	.	.	.	.	.	.	*-----*			
614	V410	.	.	.	.	.	.	.	RETAINER, ELECTRON TUBE; stainless steel, passivate finish, over-all dim.: 1-7/32 in. ID by 1-13/16 in. OD			TTE 3Y
615	XV406	.	.	.	.	.	.	.	STUD, PLAIN; same as item 604			
		.	.	.	.	.	.	.	ELECTRON TUBE		6L6WGB (MIL-E-1)	
		.	.	.	.	.	.	.	ELECTRON TUBE		6080WA (MIL-E-1)	
		.	.	.	.	.	.	.	ELECTRON TUBE; same as item 613			
		.	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 606			



Table 9-3

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Section IX

## MAJOR ASSEMBLY PARTS LIST

DEVICE NAME		Radar Signal Interference Trainer (X-Band)							CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Power Supply Chassis - 400	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)
ITEM NO. (1)	REF SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)		
616	XV402	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 606				
617	XV410	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 606				
618		.	.	.	.	.	.	ATTACHING PARTS				
619		.	.	.	.	.	.	SCREW, MACH; same as item 49				
620		.	.	.	.	.	.	WASHER, LOCK; same as item 50				
		.	.	.	.	.	.	NUT, HEX; same as item 51				
		.	.	.	.	.	.	*-----*				
621	E407	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 176				
622	E403	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 176				
623	V407	.	.	.	.	.	.	ELECTRON TUBE				
624	V403	.	.	.	.	.	.	ELECTRON TUBE; same as item 623				
625	XV407	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 188				
626	XV403	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 188				
627		.	.	.	.	.	.	STRAP, RETAINING; same as item 193				
628		.	.	.	.	.	.	ATTACHING PARTS				
		.	.	.	.	.	.	SCREW, MACH; same as item 194				
629		.	.	.	.	.	.	WASHER, LOCK; #4				
		.	.	.	.	.	.	*-----*				
630	E408	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 174				
631	E405	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 359				
632	E404	.	.	.	.	.	.	SHIELD, ELECTRON TUBE; same as item 359				
633	V408	.	.	.	.	.	.	ELECTRON TUBE				
634	V405	.	.	.	.	.	.	ELECTRON TUBE				
635	V404	.	.	.	.	.	.	ELECTRON TUBE; same as item 634				
636	XV408	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186				

5751 (MIL-E-1)

AN936A4

5651 (MIL-E-1)

6X4W (MIL-E-1)

## MAJOR ASSEMBLY PARTS LIST

ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	Radial Signal Interference Trainer (X-Band)							CONTRACT NO. N61339-29 (4)	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Power Supply Chassis - 400	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M' FGR. AND CATALOG DESIGNATION (6)
		1	2	3	4	5	6	7					
637	XV405	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186					
638	XV404	.	.	.	.	.	.	SOCKET, ELECTRON TUBE; same as item 186					
639		.	.	.	.	.	.	STRAP, RETAINING, same as item 192					
640		.	.	.	.	.	.	ATTACHING PARTS					
641		.	.	.	.	.	.	SCREW, MACH; same as item 194					
642	J404	.	.	.	.	.	.	WASHER, LOCK; same as item 629					
		.	.	.	.	.	.	*-----*					
643	T401	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; 5 female contacts, w/lock ring, supplied w/attaching hardware, over-all dim.: 23/32 in. dia by 17/32 in. deep					WTQ M5S-LRN
		.	.	.	.	.	.	TRANSFORMER, POWER, STEP-DOWN AND STEP-UP; primary: 115v 50 to 440 cps, secondaries: first: 440-0-440v, second: 5v, third and fourth: 6.4v, fifth: 400-0-400, over-all dim. excluding mtg studs: 5-9/16 in. lg by 4-5/16 in. wide by 5 in. high	B111677				
644		.	.	.	.	.	.	BRACKET, ANGLE; aluminum, caustic etched and iridite finish, over-all dim.: 6 in. wide by 5-13/32 in. high by 4-23/32 in. deep	B116406				
645		.	.	.	.	.	.	ATTACHING PARTS					
		.	.	.	.	.	.	WASHER, LOCK; #1/4			AN936B416		
646		.	.	.	.	.	.	NUT, HEX; cadmium plated steel, 1/4-20 NC-2 thread					
		.	.	.	.	.	.	*-----*					
647	J403	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; 20 female contacts	A502828			MS24013	
648	J405	.	.	.	.	.	.	CONNECTOR, RECEPTACLE, ELECTRICAL; 4 female contacts, w/lock ring, supplied w/attaching hardware, over-all dim.: 5/8 in. dia by 17/32 in. deep					WTQ M4S-LRN
649	J401	.	.	.	.	.	.	JACK, TIP; same as item 199					
650	J402	.	.	.	.	.	.	JACK, TIP; same as item 199					
651	R434	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 224					
652	R419	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1 megohm $\pm 10\%$ , 1 watt				RC32GF105K (MIL-R-11B)	

Table 9-3

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Section IX

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)									
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)
653	R416	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 470 ohms $\pm 10\%$ , 1/2 watt
654	C411	.	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 22,000 uuf $\pm 10\%$ , 200 vdc
655	R406	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 653
656	R405	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 653
657	R412	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 220 ohms $\pm 5\%$ , 1/2 watt
658	R421	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 653
659	R418	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 653
660		.	.	.	.	.	.	.	POST, TERMINAL; same as item 159
661		.	.	.	.	.	.	.	ATTACHING PARTS
662		.	.	.	.	.	.	.	SCREW, MACH; same as item 194
663	A401	.	.	.	.	.	.	.	WASHER, LOCK; same as item 115 *-----*
664		.	.	.	.	.	.	.	TERMINAL BOARD ASSEMBLY
665		.	.	.	.	.	.	.	ATTACHING PARTS
666	R422	.	.	.	.	.	.	.	SCREW, MACH; same as item 386
667	R431	.	.	.	.	.	.	.	WASHER, LOCK; same as item 50 *-----*
668	R408	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 27 ohms $\pm 5\%$ 2 watts
669	R413	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 666
670	R430	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 27 ohms $\pm 10\%$ 2 watts
		.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 470,000 ohms $\pm 5\%$ , 1/2 watt
		.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 224



## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Power Supply Chassis - 400	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)	
671	R427	.	.	.	.	.	.	.	RESISTOR, FIXED, WIREWOUND; 560,000 ohms, 1/2 watt, over-all body dim.: 0.565 in. dia by 11/16 in. lg	B116391	RC20GF103K (MIL-R-11B)		
672	R425	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 10,000 ohms ±10%, 1/2 watt		RC20GF105J (MIL-R-11B)		
673	R411	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1 megohm ±5%, 1/2 watt				
674	R437	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 224				
675	R436	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 224				
676	R417	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 224				
677	R420	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 4700 ohms ±10%, 2 watts		RC42GF472K (MIL-R-11B)		
678	R410	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 330,000 ohms ±10%, 2 watts		RC42GF384K (MIL-R-11B)		
679	R415	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 669	B116403	RC20GF155J (MIL-R-11B)		
680	R429	.	.	.	.	.	.	.	RESISTOR, FIXED, WIREWOUND; 220,000 ohms, 1/2 watt, over-all body dim.: 0.565 in. dia by 11/16 in. lg		RC42GF100K (MIL-R-11B)		
681	R403	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 1.5 megohms ±5%, 1/2 watt				
682	R438	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 10 ohms ±10%, 2 watts				
683	R404	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 237				
684	R407	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 337				
685	R409	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 668				
686	R435	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 224		RC20GF684K (MIL-R-11B)		
687	R433	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 680,000 ohms ±10%, 1/2 watt				
688	R432	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 230				
689	R424	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; same as item 673				

Table 9-3

NAVEXOS P-1856

Section IX

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO. N61339-29	DEVICE NO. 15X12	MAJOR ASSEMBLY AND NO. SERIES Power Supply Chassis - 400	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)	
690	R423	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 620,000 ohms ±5%, 1/2 watt	B509501	RC20GF624J (MIL-R-11B)		
691	R426	.	.	.	.	.	.	.	RESISTOR, FIXED, COMPOSITION; 180,000 ohms ±5%, 1 watt				
692		.	.	.	.	.	.	.	BRACKET, ANGLE; cadmium plated steel, over-all dim.: 2-1/16 in. lg by 1 in. wide				
693		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 148				
694		.	.	.	.	.	.	.	WASHER, LOCK; same as item 50				
695		.	.	.	.	.	.	.	WASHER, FLAT; same as item 77 *-----*	C111127	RC32GF184J (MIL-R-11B)		
696	TB401	.	.	.	.	.	.	.	TERMINAL BOARD; phenolic, w/36 turret type lugs, over-all dim.: 6-1/4 in. lg by 2-1/16 in. wide by 1/8 in. thk				
697	C406	.	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; 470,000 uuf ±10%, 400 vdc				CP10A1EE474K (MIL-C-25A)
698		.	.	.	.	.	.	.	TERMINAL, LUG; same as item 122				
699	C415	.	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 697				
700	C402	.	.	.	.	.	.	.	CAPACITOR, FIXED, PAPER DIELECTRIC; same as item 697				
701		.	.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 49				
702		.	.	.	.	.	.	.	WASHER, LOCK; same as item 50				
703		.	.	.	.	.	.	.	NUT, HEX; same as item 51 *-----*				
704	A402	.	.	.	.	.	.	.	SHAFT LOCK ASSEMBLY; same as item 135				
705		.	.	.	.	.	.	.	NUT, LOCK; same as item 136				
706		.	.	.	.	.	.	.	BUSHING-SHAFT, PANEL; same as item 137				

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO.	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	MAJOR ASSEMBLY AND NO. SERIES Power Supply Chassis - 400
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)				COMMERCIAL M'FR. AND CATALOG DESIGNATION (6)
707	R428	.	.	.	.	.	.	.	RESISTOR, VARIABLE, COMPOSITION; same as item 142	A512427			
708	R414	.	.	.	.	.	.	.	RESISTOR, VARIABLE, COMPOSITION; same as item 142				
709	S402	.	.	.	.	.	.	.	SWITCH, THERMOSTATIC; same as item 278				
710		.	.	.	.	.	.	.	ATTACHING PARTS				
711		.	.	.	.	.	.	.	SCREW, MACH; binding head, cadmium plated steel, 4-40NC-2 thread by 5/8 in. lg				
712		.	.	.	.	.	.	.	WASHER, LOCK; same as item 115				
		.	.	.	.	.	.	.	NUT, HEX; same as item 219				
		.	.	.	.	.	.	.	*-----*				
713		.	.	.	.	.	.	.	POST, MOUNTING; gray anodized aluminum, circular shape, over-all dim.: 0.15 in. OD by 1/4 in. ID by 3/8 in. lg				
714		.	.	.	.	.	.	.	POST, TERMINAL; same as item 159				
715		.	.	.	.	.	.	.	ATTACHING PARTS	B510115			
716		.	.	.	.	.	.	.	SCREW, MACH; same as item 289				
		.	.	.	.	.	.	.	WASHER, LOCK; same as item 629				
		.	.	.	.	.	.	.	*-----*				
717		.	.	.	.	.	.	.	POST, TERMINAL; melamine body, silver plated brass terminals, 4-40 internal thread 7/32 in. deep, over-all dim.: 1/4 in. across flats by 27/32 in. high				
718		.	.	.	.	.	.	.	ATTACHING PARTS				
719		.	.	.	.	.	.	.	SCREW, MACH; same as item 710				
		.	.	.	.	.	.	.	WASHER, LOCK; same as item 115				
		.	.	.	.	.	.	.	*-----*				
720		.	.	.	.	.	.	.	GROMMET, ELASTIC; 5/8 in. ID	D113126		AN931-10-14 (MIL-G-3036)	
721	A403	.	.	.	.	.	.	.	FASTENER ASSEMBLY, CHASSIS				
722		.	.	.	.	.	.	.	NUT, SELF-LOCKING, PLATE; aluminum, floating type, two 0.098 in. dia mtg holes on 0.312 in. centers, 6-32 NC-2 thread, over-all dim.: 1.063 in. lg by 0.531 in. wide				

EN  
22NA217-22-62

EN  
22NA217-22-62



Table 9-3

NAVE XOS P-1856

Section IX

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)										CONTRACT NO.	DEVICE NO.	MAJOR ASSEMBLY AND NO. SERIES	
PART NAME AND DESCRIPTION (3)										N61339-29	15X12	Power Supply Chassis - 400	
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PRIME CONTRACTOR'S DRAWING NO. (PART NO.) (4)	GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)	COMMERCIAL M'FG. AND CATALOG DESIGNATION (6)		
723		.	.	.	.	.	.	NUT, SELF-LOCKING, PLATE; aluminum, floating type, two 0.098 in. dia mtg holes on 0.688 in. centers, 6-32 NC-2 thread, over-all dim.: 0.968 in. lg by 0.406 in. wide			EN 12LHA401-62		
724		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; #2-56 thread		AN505-2-5			
725		.	.	.	.	.	.	WASHER, LOCK; cadmium plated bronze, 0.116 in. ID, 0.270 in. OD	A520821				
726		.	.	.	.	.	.	NUT, HEX; #2-56 thread *-----*		AN340-2			
727		.	.	.	.	.	.	CHASSIS, POWER SUPPLY; aluminum, caustic etch and iridite finish, over-all dim.: 12-1/4 in. lg by 8-9/16 in. wide by 2-27/32 in. high	DI11991				
728	10-17	.	.	.	.	.	.	BLOWER ASSEMBLY	C110182		MS35241-34		
729		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; 6-32 thread *-----*				WTQ H19CS	
730		.	.	.	.	.	.	SHIELD, ELECTRICAL CONNECTOR; molded melamine, w/cable clamp, 19/64 in. dia max cable accommodated, over-all dim. except cable clamp: 21/32 in. dia by 21/32 in. lg					
731	P404	.	.	.	.	.	.	CONNECTOR, PLUG, ELECTRICAL; 5 male contacts, w/lock spring, supplied w/attaching hardware, over-all dim.: 25/32 in. dia by 17/32 in. deep				WTQ M5P-LSN	
732		.	.	.	.	.	.	CLAMP, CABLE; nylon, 1/4 in. dia nom size cable accommodated, 1 mtg hole 13/64 in. dia	B517512				
733		.	.	.	.	.	.	ATTACHING PARTS SCREW, MACH; same as item 450					
734		.	.	.	.	.	.	WASHER, LOCK; same as item 134					
735		.	.	.	.	.	.	NUT, HEX; same as item 268 *-----*					

## Section IX

NAVEXOS P-1856

Table 9-3

## MAJOR ASSEMBLY PARTS LIST

Radar Signal Interference Trainer (X-Band)									
ITEM NO. (1)	REF. SYMBOL NO. OR FIGURE & INDEX NO. (2)	1	2	3	4	5	6	7	PART NAME AND DESCRIPTION (3)
736		.	.	.	.	.	.	.	IMPELLER, FAN, AXIAL; aluminum, 4 blades, over-all dim.: 5 in. dia. w/attaching hardware
737	B401	.	.	.	.	.	.	.	MOTOR, ALTERNATING CURRENT; 115v ac, 50-1000 cps, single phase, 0.4 amp 1/300 hp, 2500 rpm
738		.	.	.	.	.	.	.	ATTACHING PARTS
739		.	.	.	.	.	.	.	SCREW, MACH; same as item 49
		.	.	.	.	.	.	.	WASHER, LOCK; same as item 50
		.	.	.	.	.	.	.	*-----*
740		.	.	.	.	.	.	.	BRACKET, AXIAL FAN; cadmium plated CRES, 3 radiating arms evenly spaced 120° apart, over-all dim. each arm: 1/2 in. wide by 1/8 in. thk by 2-3/4 in. lg from center hole
		.	.	.	.	.	.	.	ATTACHING PARTS
741		.	.	.	.	.	.	.	SCREW, MACH; cadmium plated steel, 10-32 NF-2 thread 3/8 in. lg
742		.	.	.	.	.	.	.	WASHER, LOCK; same as item 29
		.	.	.	.	.	.	.	*-----*
743		.	.	.	.	.	.	.	PLATE, RETAINING, AXIAL FAN; aluminum, caustic etch and iridite finish, w/protective ring for impeller, over-all dim.: 6-3/4 in. lg by 6-25/32 in. high by 27/32 in. deep
744		.	.	.	.	.	.	.	FRAME, RADAR SIGNAL INTERFERENCE; aluminum, caustic etched and iridite finish, w/permanently afixed hardware, over-all dim.: 17-1/2 in. wide by 11-1/2 in. high by 13-1/8 in. deep

MAJOR ASSEMBLY AND NO. SERIES

DEVICE NO.

CONTRACT NO.

PRIME CONTRACTOR'S DRAWING NO. (PART NO.)

GOVERNMENT TYPE DESIGNATION AND SPECIFICATION NUMBER (5)

COMMERCIAL M'FGR. AND CATALOG DESIGNATION (6)

Power Supply Chassis - 400

15X12

N61339-29

B108068

A152175

C111759

D109970

TTM

0-520 -4

Rotating Components Inc

NBC-K15-8

CONTRACT NO. N61339-29

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12

TABLE 9-4 NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
AK5100		135			13	
AK5168		192			17	
AK5169		193			7	
AN123866		6			1	
AN315-3R		488			2	
AN340-2		726			8	
AN340-4		219			12	
AN340-6		51			36	
AN340-8		268			8	
AN500-8-12		266			4	
AN500A2-5		303			6	
AN505-2-5		724			8	
AN510-10-8		31			4	
AN515-4-5		18			4	
AN515C4-4		317			8	
AN535-2-2		65			4	
AN931-10-14		720	5325-249-6354		1	
AN931-12-17		121	5325-286-5944		1	
AN931-6-10		358			1	
AN931A7-11		306			1	
AN935-2		304			6	
AN935-4L		19			4	
AN935-8L		267			4	
AN936A4		629			13	
AN936B10		29			13	
AN936B4		115			65	
AN936B416		645			4	
AN936B6		50			74	
AN936A616		145			8	
AN936B8		134			16	
AN936C10		32			4	
AP15297		136			13	
AP15342		137			13	
A107612		17			2	
A107625		316			1	
A152175		741			3	
A532823		277			9	
A502825		286			1	
A502828		646			4	



TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
A503602		445			4	
A503603		276			10	
A503604		452			1	
A503613		77			26	
A512422		194			48	
A512423		289			13	
A512424		160			10	
A512427		710			4	
A512428		216			6	
A512429		279			2	
A512443		255			4	
A512444		386			7	
A512445		263			6	
A512446		49			35	
A512447		148			5	
A512450		344			2	
A512461		133			14	
A512462		450			2	
A512475		28			8	
A512647		372			1	
A515902		275			13	
A520803		290			4	
A520821		725			8	
A520827		146			8	
A523201		717			2	
A523203		159			12	
BP-16431		426			1	
B107609		20			1	
B107623		315			1	
B107624		314			1	
B107626		313			1	
B108068		740			1	
B109806		326			1	
B109807		342			1	
B110305		254			1	
B111026		392			1	
B111027		36			1	
B111126		663			1	
B111137		600			1	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
B111677		643			1	
B111735		307			1	
B111736		309			1	
B111738		294			1	
B111742		298			2	
B111744		308			1	
B111749		348			1	
B111755		129			1	
B111756		123			1	
B111758		251			1	
B111985		100			1	
B111986		258			1	
B111988		355			1	
B111992		45			1	
B112008-1		91			1	
B112008-2		87			1	
B112008-3		83			1	
B112008-4		79			1	
B112009		44			1	
B113113		43			1	
B113114		95			1	
B113115		96			1	
B115985		272			1	
B115986		283			1	
B116390		7			2	
B116391		671			1	
B116392		229			1	
B116396		301			1	
B116397		11			1	
B116403		680			1	
B116406		644			1	
B116407		302			1	
B116408		322			1	
B116741		288			1	
B509501		692			2	
B510115		713			2	
B517506		74			2	
B517512		732			1	
B517516		371			1	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
B517518		147			2	
C-173A	Mepco Co. Inc.	169			1	
C-173B	Mepco Co. Inc.	170			1	
CE41C100Q		598	5910-112-7801		2	
CE41C250Q		596			2	
CE41C500Q		594	5910-184-3838		2	
CK83Y103Z		172			4	
CM20B101J		352	5910-101-5616		2	
CM20B101K		332			2	
CM20B151J		517	5910-101-5590		2	
CM20B300J		549	5910-101-5771		1	
CM20B470K		501	5910-101-4900		1	
CM20B680J		214	5910-101-5654		1	
CM30B821K		551	5910-160-1808		1	
CM35B103K		336			1	
CM35B472K		433			1	
CM35B912J		582			2	
CO-02MFF(2/16)SJ0375		14			1	
CP05A1EC104K		127	5910-667-7062		1	
CP05A1EF104K		382			2	
CP05A1EF104M		158	5910-644-0689		1	
CP05A1KF223K		580	5910-644-6161		1	
CP06SA1		430			1	
CP06SA3		423	5910-129-6123		2	
CP06SA4		497			1	
CP07SA3		486			1	
CP09A1EC223K		654			1	
CP09A1EF103K		384			1	
CP10A1EE474K		697			3	
CP10A1EF104M		412			2	
CP11A1EF104K		380			2	
CP11A3EB105M		417			1	
CP11A3EE104M		416			1	
CP11A3EF104K		500			1	
CP41B1FF405K		252	5910-129-9237		2	
CP55B1EF504K		376	5910-170-2779		1	
CP61B1EF254M		422	5910-112-7426		2	
CP61B1EF503K		429	5910-112-7319		1	
CP61B1EF504M		496			1	



TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
CP70B1FF205K		485	5910-112-7431		1	
CV11A120		558	5910-556-9439		1	
CV11C450		215	5910-112-8247		2	
C107607		16			1	
C107638		262			1	
C109801		388			1	
C110093		589			1	
C110087		590			1	
C110182		728			1	
C110327		201			1	
C110539		257			1	
C111127		696			1	
C111759		743			1	
C111987		111			1	
C111990		21			1	
C112007		130			1	
C112182		265			1	
C115990		293			1	
C115991		269			1	
C109800		323			1	
D109874		591			1	
D109970		744			1	
D109975		1			1	
D110094		505			1	
D110098		389			1	
D110178		26			1	
D110317		132			1	
D111746		310			1	
D111748		27			1	
D111991		727			1	
D111993		131			1	
D111994		40			1	
D111995		37			1	
D111996		66			1	
D111997		42			1	
D111998		47			1	
D113126		721			1	
D113860		4			1	
D113873		2			1	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
FHN20G		58		3	6	
F03G3R00B		52	5920-280-5039		6	
H10C	WIQ	270	5935-280-2204		1	
H19C	WIQ	296	5935-258-1757		1	
H19CS	WIQ	730			1	
JJ-089		72	5935-192-4789		1	
J1301-3		71			1	
LH50PR5		69			1	
LH64PA5		70			1	
MRE14H		357			1	
MRE20H	WIQ	110			1	
MRE34H	WIQ	447	5935-280-2202		1	
MRE41H	WIQ	153			1	
MR26W002DCMA		39			1	
MS15571-2		67	6240-155-8706	2	1	
MS16108-2		199			9	
MS24009		118			1	
MS24010		356			1	
MS24013		647			1	
MS24014		109			1	
MS24021		116			1	
MS24022		448			1	
MS24023		114			1	
MS24024		152			1	
MS35241-34		729			8	
MS35241-37		593			4	
MS35241-38		592			4	
MX-1530/U		80			4	
M36BS440-14CR		299			2	
M4P-LS	FLN	271			1	
M4S-LRN	WIQ	648			1	
M5P-LSN	WIQ	731			1	
M5S-LRN	WIQ	642			1	
M7P-LS	WIQ	297			1	
M7S-LRN	WIQ	162	5935-258-2920		1	
NBC-K15-8	Rotating Component	737			1	
NE-51		68			1	
RC20GF101K		247	5905-186-3008		1	
RC20GF102J		566	5905-195-6806		2	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
RC20GF103J		241	5905-185-8518		1	
RC20GF103K		672	5905-195-6761		1	
RC20GF104K		128	5905-192-0390		3	
RC20GF105J		673	5905-192-3982		2	
RC20GF105K		206	5905-120-1174		2	
RC20GF114J		567	5905-279-1868		1	
RC20GF115J		228	5905-279-3502		1	
RC20GF123J		570	5905-190-8884		2	
RC20GF123K		220	5905-195-6500		2	
RC20GF124K		583	5905-190-8874		1	
RC20GF125J		211	5905-279-1757		1	
RC20GF134J		503	5905-279-2522		1	
RC20GF152J		579	5905-279-1872		1	
RC20GF154J		354	5905-190-8879		1	
RC20GF155J		681	5905-192-0662		2	
RC20GF165J		573	5905-279-1873		1	
RC20GF183K		222	5905-192-0649		1	
RC20GF184K		231	5905-107-4767		1	
RC20GF185J		568	5905-171-2009		1	
RC20GF203J		239	5905-186-2987		2	
RC20GF205J		171	5905-192-0667		1	
RC20GF221J		657	5905-239-3409		1	
RC20GF222K		543	5905-239-0569		1	
RC20GF223K		334	5905-279-2512		1	
RC20GF224J		569	5905-249-9491		2	
RC20GF224K		230	5905-279-1882		4	
RC20GF225K		523	5905-195-6502		1	
RC20GF245K		208	5905-279-2519		1	
RC20GF274K		545	5905-114-1928		1	
RC20GF275K		207	5905-279-3498		1	
RC20GF332K		502	5905-279-6486		3	
RC20GF334J		572	5905-171-2005		1	
RC20GF364J		232	5905-195-6451		1	
RC20GF433J		571			1	
RC20GF434J		533			1	
RC20GF470J		242			1	
RC20GF471J		529			1	
RC20GF471K		653			1	
RC20GF472K		550			5	



TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
RC20GF473K		337	5905-295-3410		4	
RC20GF474J		669	5905-279-2515		2	
RC20GF474K		520	5905-185-6946		1	
RC20GF512J		581	5905-279-2019		2	
RC20GF513J		244	5905-279-3496		2	
RC20GF514J		546	5905-279-2516		1	
RC20GF561J		528	5905-195-6800		1	
RC20GF564K		524	5905-221-5840		1	
RC20GF623J		518	5905-249-3656		1	
RC20GF624J		690	5905-221-5841		1	
RC20GF681J		509	5905-195-6791		1	
RC20GF683J		555	5905-249-3661		1	
RC20GF683K		209	5905-254-7087		1	
RC20GF684K		687	5905-221-5842		1	
RC20GF753K		330			2	
RC20GF823K		243	5905-254-7097		1	
RC20GF824J		213	5905-221-5848		1	
RC20GF824K		527	5905-107-3214		1	
RC32GF105K		652			1	
RC32GF184J		691	5905-279-2597		1	
RC32GF223K		516	5905-299-2019		1	
RC32GF271K		331	5905-101-9957		2	
RC32GF471J		510	5905-120-2170		1	
RC32GF473K		525	5905-102-2444		1	
RC32GF623J		233	5905-299-2009		1	
RC32GF751J		205			1	
RC32GF823K		519	5905-537-6463		2	
RC42GF100K		682			1	
RC42GF103J		531	5905-185-8516		2	
RC42GF103K		338			1	
RC42GF104K		224	5905-171-1978		10	
RC42GF122K		38			1	
RC42GF162J		554	5905-665-6043		1	
RC42GF181K		335			1	
RC42GF183K		526	5905-249-4227		1	
RC42GF202J		552	5905-256-8355		1	
RC42GF270J		668	5905-279-1747		2	
RC42GF270K		666	5905-279-1925		2	
RC42GF332J		557	5905-257-0926		3	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

## NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
RC42GF32K		511	5905-195-6748		2	
RC42GF334K		678			1	
RC42GF362J		553	5905-195-6750		1	
RC42GF472J		575	5905-257-0937		1	
RC42GF472K		677	5905-195-6449		1	
RC42GF473K		237	5905-190-8873		3	
RC42GF513J		547	5905-254-7708		2	
RC42GF513K		223			1	
RC42GF682J		212	5905-279-2528		1	
RC42GF682K		512	5905-279-2295		2	
RC42GF683K		234	5905-254-7090		2	
RC42GF822K		515	5905-249-4198		1	
RG-62/U		82	6145-161-0913		69-1/4 in.	
RG-71/U		261	6145-161-0916		9 in.	
RG-9/U		10			84 in.	
RH50G502H		442			1	
RN25X6003J		173			1	
RS-5		556	5905-644-9438		1	
RV4NAVSD103A		139			1	
RV4NAVSD104A		41	5905-518-7047		2	
RV4NAVSD105A		140			2	
RV4NAVSD251A		166			1	
RV4NAVSD254A		492			1	
RV4NAVSD563A		142			5	
RV4NAVSD504A		46	5905-642-3576		3	
RW20G392		343			1	
TS101P01		606	5935-260-0517		4	
TS102P01		186	5935-260-0516		17	
TS102U02		174	5960-272-9094		10	
TS102U03		358	5960-295-7652		7	
TS103P01		188	5635-160-1365		7	
TS103U02		176	5960-264-3004		7	
UG-1094/U		155	5935-665-5718		5	
UG-119/UP		312			1	
UG-160B/U		101			1	
UG-203/U		260	5935-149-5358		1	
UG-21B/U		8	5935-149-4236		1	
UG-260B/U		81	5935-149-4055		3	
UG-625A/U		73			6	
U2463	MRQ	287			2	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY PER KIT	QTY. PER TNR.	SOURCE CODE
X-1942-X	CGT	284			1	
X2111-C-B0	CGT	30			2	
0-520-4	TTM	736			1	
0A2WA		468	5960-262-0964	2	1	
1N126		340			1	
1N23C		311		1	1	
1N69		249	5960-194-9408	3	3	
106	ZE	536			2	
11014-11	SOCH	23			4	
12-11-205-12	SOCH	22			4	
12A TWA		182	5960-262-0167		2	
12LHA401-62	EN	723			2	
125-3-2	RAY	35			1	
13	ULC	278			2	
15Y	TTE	603	5960-270-8165		1	
156	TRII	15	5965-128-8756		1	
2K45		300	5960-188-8625	1	1	
200-AC	HALK	5			1	
210406-00	SH	122			2	
2161	SHH	218			2	
22NA217-22-62	EN	722			12	
2600-4SW	CLC	3			2	
3Y	CLC	610			2	
333	ZE	393			3	
42	TTE	604			3	
46A1	VIEC	535			5	
5R4WGA		605	5960-262-1703	1	1	
5S3-1	CLC	25			1	
5S5-14	CLC	24			2	
52-012-062-0250	AG	305			2	
5651		633		1	1	
5751		623	5960-193-5145	2	2	
5814A		401			3	
6AH6		464	5960-166-7667	1	1	
6AU6WA		183	5960-262-0152	6	6	
6D4		395	5960-108-0263	1	1	
6L6WGB		612	5960-262-0161	1	1	
6X4W		634	5960-272-9182	2	2	
6002-1A	AAEP	273			1	



TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

NUMERICAL PARTS LIST

PART NO.	MFR. CODE	ITEM NO.	GOVERNMENT STOCK NO.	QTY. PER KIT	QTY. PER TNR.	SOURCE CODE
6005/6AQ5W		362	5960-669-6861	2	2	
6080WA		613	5960-262-0181	2	2	
6100/6C4WA		180		3	4	
6480A	BBR	203			4	
70-4-2	RAY	34	5355-644-2083		5	
7506	HAW	12	5935-295-5351		1	
7524	HBCO	48			1	
7547	HAW	13	5935-259-9784		1	
773	WIQ	385			5	
90-3-2	RAY	33			5	

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

TABLE 9-5 REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.
A101	B109806	326
A102	B111749	348
A201	B111026	392
A202	AK5100	489
A203	D110094	505
A301	C110327	201
A302	AK5100	135
A303	AK5100	163
A304	C111987	111
A305	B107624	314
A401	C111126	663
A402	AK5100	704
A403	D113126	721
A501	B111756	123
A801	C107607	16
B401	NBC-K15-8	737
CR101	1N126	340
CR201	1N69	565
CR301	1N69	250
REF. SYMBOL NO.	PART NO.	ITEM NO.
CR302	1N69	249
CR501	1N23C	311
C101	CM20B101J	352
C102	CP09A1EF 103K	384
C103	CP11A1EF 104K	381
C104	CM20B101K	332
C105	CP05A1EF 104K	383
C106	CP11A1EF 104K	380
C107	CM35B103K	336
C108	CM20B101K	341
C109	CP05A1EF 104K	382
C110	CP55B1EF 504K	376
C201	CP61B1EF 254M	422
C202	CP10A1EF 104M	412
C203	CP11A3EB 105M	417
REF. SYMBOL NO.	PART NO.	ITEM NO.
C204	CP10A1EF 104M	418
C205	CP11A3EE 104M	416
C206	CM20B151J	585
C207	CM35B912J	582
C208	CM35B912J	584
C209	CM20B151J	517
C210	CP61B1EF 254M	480
C211	CP70B1FF 205K	485
C212	CP61B1EF 503K	429
C213	CM20B101J	574
C214	CM20B300J	549
C215	CM35B472K	433
C216	CP11A3EF 104K	500
C217	CV11C450	559
C218	CV11A120	558
C219	CM20B470K	501

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

## REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.
C220	CP61B1EF 504M	496
C221	CK63Y103Z	504
C223	CP05A1KF 223K	580
C224	CM30B821K	551
C301	CP41B1FF 405K	252
C302	CP41B1FF 405K	253
C303	CP05A1EF 104M	158
C304	CP05A1EC 104K	127
C308	CK63Y103Z	240
C309	CV11C450	215
C311	CM20B680J	214
C312	CK63Y103Z	210
C314	CK63Y103Z	172
C401	CE41C250Q	596
C402	CP10A1EE 474K	700
C403	CE41C100Q	599
REF. SYMBOL NO.	PART NO.	ITEM NO.
C406	CP10A1EE 474K	697
C407	CE41C250Q	597
C408	CE41C100Q	598
C411	CP09A1EC 223K	654
C412	CE41C500Q	594
C413	CE41C500Q	595
C415	CP10A1EE 474K	899
DS401	MS15571-2	67
DS402	NE-51	68
E101	TS102U03	361
E102	TS102U03	360
E103	TS102U03	359
E202	TS102U02	396
E203	TS103U02	397
E204	TS103U02	399
E205	TS102U02	398
E206	TS102U02	458
E207	TS102U03	459
REF. SYMBOL NO.	PART NO.	ITEM NO.
E208	TS103U02	460
E209	TS102U03	462
E210	TS103U02	461
E211	TS102U02	463
E212	MX-1530/U	80
E213	MX-1530/U	84
E301	TS102U02	179
E302	TS102U02	178
E303	TS102U02	175
E304	TS103U02	176
E305	TS102U02	177
E306	TS102U02	174
E307	MX-1530/U	88
E308	MX-1530/U	92
E311	B1111744	308
E312	B1111736	309
E403	TS103U02	622
E404	TS102U03	632
E405	TS102U03	631
E407	TS103U02	621



TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.
E408	TS102U02	630
E801	B107609	20
F401	F03G3R00B	52
F402	F03G3R00B	53
F403	F03G3R00B	54
F404	F03G3R00B	55
F405	F03G3R00B	56
F406	F03G3R00B	57
HR401	B115985	272
HT101	156	15
J101	MS24009	118
J102	JJ-089	72
J201	MS24021	116
J202	UG-1094/U	484
J203	UG-1094/U	495
J204	MS16108-2	437
J205	MS16108-2	438
J206	MS16108-2	439
J207	MS16108-2	440

REF. SYMBOL NO.	PART NO.	ITEM NO.
J208	MS16108-2	441
J301	MS24023	114
J302	UG-1094/U	156
J303	M7S-LRN	162
J304	UG-1094/U	157
J305	UG-1094/U	155
J306	UG-625A/U	120
J307	MS16108-2	200
J308	UG-625A/U	73
J309	UG-160B/U	101
J310	A107612	319
J311	B107623	315
J316	MS16108-2	199
J401	MS16108-2	649
J402	MS16108-2	650
J403	MS24013	647
J404	M5S-LRN	642
J405	M4S-LRN	648
J406	7524	48

REF. SYMBOL NO.	PART NO.	ITEM NO.
J501	A107612	17
K201	BP-16431	426
M301	MR26W002 DCMA	39
N401	B116741	288
P101	MS24010	356
P201	MS24022	448
P202	UG-260B/U	85
P203	UG-260B/U	81
P301	MS24024	152
P302	UG-260B/U	295
P303	M7P-LS	297
P304	UG-260B/U	89
P305	UG-260B/U	93
P306	UG-260B/U	259
P309	UG-21B/U	8
P310	UG-21B/U	102
P312	UG-203/U	260
P403	MS24014	109
P404	M5P-LSN	731

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61399-29

## REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.
P405	M4P-LS	271
P406	7506	12
P501	UG-21B/U	9
P701	7547	13
RT237	46A1	535
R101	RC20GF 223K	353
R102	RC20GF 154J	354
R103	RC20GF 753K	330
R104	RC32GF 271K	331
R105	RC20GF 753K	333
R106	RC20GF 223K	334
R107	RC42GF181K	335
R108	RC20GF473K	337
R109	RC42GF103K	338
R110	RW20G392	343
R111	RC32GF271K	339

REF. SYMBOL NO.	PART NO.	ITEM NO.
R115	RV4NAVSD 504A	46
R201	RC42GF822K	515
R202	RC42GF332K	514
R203	RC42GF332K	511
R204	RC42GF682K	512
R205	RC42GF682K	513
R206	RC20GF473K	530
R207	RC32GF223K	516
R208	RC20GF561J	528
R209	RC32GF823K	519
R210	RC20GF623J	518
R212	RC20GF104K	534
R213	RC20GF222K	543
R214	B111992	45
R215	RC20GF434J	533
R216	RC20GF165J	573
R217	RC20GF274K	545
R218	RV4NAVSD 104A	494

REF. SYMBOL NO.	PART NO.	ITEM NO.
R219	RC20GF124K	583
R220	B113113	43
R221	RC20GF134J	503
R222	RC20GF224K	577
R223	RC20GF514J	546
R224	RC42GF513J	647
R225	RC42GF513J	548
R226	RC20GF433J	571
R227	RV4NAVSD 503A	493
R228	RC20GF104K	532
R229	RC20GF512J	588
R230	B111027	36
R232	RC20GF102J	566
R233	RC20GF123J	586
R234	RC20GF102J	587
R235	RC20GF123J	570
R236	RC20GF512J	581
R238	RC32GF473K	525

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## REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
R239	RC20GF681J	509	R258	RC20GF334J	572	R303	RC20GF183K	222
R240	RC32GF823K	522	R259	RC20GF472K	550	R304	RC20GF123K	221
R242	RC20GF473K	521	R260	RC42GF103J	531	R305	RC20GF123K	220
R243	RC20GF474K	520	R261	RC20GF471J	529	R306	RC20GF224K	246
R244	RH50G502H	442	R262	RC20GF224J	569	R307	RV4NAVSD 105A	144
R245	RC32GF471J	510	R263	RC20GF185J	568	R308	RC20GF823K	243
R246	RC42GF183K	526	R264	RC42GF332J	557	R309	RC20GF513J	244
R247	RC20GF332K	542	R265	RC42GF332J	564	R310	RC20GF513J	245
R248	RC20GF225K	523	R266	RC42GF332J	563	R312	RC42GF683K	236
R249	RC20GF824K	527	R267	RC20GF114J	567	R313	RV4NAVSD 503A	142
R250	RV4NAVSD 254A	492	R268	RC20GF152J	579	R314	RC42GF683K	234
R252	RC42GF472J	575	R269	RS-5	556	R315	B112009	44
R253	RC20GF154J	576	R270	RC20GF683J	555	R316	RC20GF203J	239
R254	RC42GF103J	544	R272	RC20GF332K	502	R317	RV4NAVSD 503A	143
R255	RC42GF162J	554	R273	RC20GF332K	578	R318	RC20GF103J	241
R256	RC42GF362J	553	R274	RC20GF564K	524	R319	RC20GF224K	230
R257	RC42GF202J	552	R278	RV4NAVSD 104A	41	R320	RC20GF105K	206
			R301	RC20GF683K	209	R322	RC20GF364J	232
			R302	RV4NAVSD 504A	138			



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## REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
R323	RV4NAVSD 504A	141	R347	RC42GF104K	226	R410	RC42GF334K	678
R324	RC20GF184K	231	R348	RC42GF104K	225	R411	RC20GF105J	673
R325	RC20GF184K	235	R350	B116392	229	R412	RC20GF221J	657
R326	RC32GF623J	233	R352	RC42GF104K	224	R413	RC20GF474J	669
R327	RN25X6003J	173	R353	RV4NAVSD 103A	139	R414	RV4NAVSD 503A	708
R328	RC20GF245K	208	R354	RC20GF115J	228	R415	RC20GF474J	679
R329	RC20GF275K	207	R356	RC42GF513K	223	R416	RC20GF471K	653
R330	RC20GF104K	128	R357	RC32GF751J	205	R417	RC42GF104K	676
R335	RV4NAVSD 105A	140	R358	RV4NAVSD 251A	166	R418	RC20GF471K	659
R336	RC20GF101K	247	R359	C-173A	169	R419	RC32GF105K	652
R337	RC42GF473K	237	R360	C173B	170	R420	RC42GF472K	677
R338	RC42GF473K	238	R399	RC42GF122K	38	R421	RC20GF471K	658
R339	RC20GF470J	242	R403	RC20GF155J	681	R422	RC42GF270J	666
R340	RC20GF105K	248	R404	RC42GF473K	683	R423	RC20GF624J	690
R342	RC20GF824J	213	R405	RC20GF471K	656	R424	RC20GF105J	689
R343	RC20GF125J	211	R406	RC20GF471K	655	R425	RC20GF103K	672
R344	RC42GF682J	212	R407	RC20GF473K	684	R426	RC32GF184J	691
R345	RC20GF205J	171	R408	RC42GF270K	668	R427	B116391	671
R346	RC42GF104K	227	R409	RC42GF270J	685	R428	RV4NAVSD 503A	707

TRAINER, RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.
R429	B116403	680
R430	RC42GF104K	670
R431	RC42GF270K	667
R432	RC20GF224K	688
R433	RC20GF684K	687
R434	RC42GF104K	651
R435	RC42GF104K	686
R436	RC42GF104K	675
R437	RC42GF104K	674
R438	RC42GF100K	682
S201	D111995	37
S301	D111994	40
S302	D111997	42
S303	D111993	47
S401	D111996	66
S402	13	709
S403	13	278
TB101	B111988	355
TB102	B109807	342

REF. SYMBOL NO.	PART NO.	ITEM NO.
TB201	C110093	589
TB301	B111758	251
TB401	C111127	696
TB501	B111755	129
T401	B111677	643
T402	B111137	600
V101	6AU6WA	364
V102	6AU6WA	363
V103	6005/6AQ5W	362
V201	6D4	395
V202	6AU6WA	400
V203	5814A	401
V204	12AT7WA	403
V205	6AU6WA	402
V206	6AH6	464
V207	6005/6AQ5W	465
V208	5814A	466
V209	OA2WA	468
V210	5814A	467

REF. SYMBOL NO.	PART NO.	ITEM NO.
V211	6100/6C4WA	469
V301	6100/6C4WA	185
V302	6AU6WA	184
V303	6100/6C4WA	181
V304	12AT7WA	182
V305	6AU6WA	183
V306	6100/6C4WA	180
V307	2K45	300
V401	5R4WGA	605
V402	6080WA	613
V403	5751	624
V404	6X4W	635
V405	6X4W	634
V406	6L6WGB	612
V407	5751	623
V408	5651	633
V410	6080WA	614
W201	B112008-4	79
W202	B112008-3	83

RADAR SIGNAL INTERFERENCE (X-BAND) DEVICE 15X12 CONTRACT NO. N61339-29

## REFERENCE SYMBOL NUMBER LIST

REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.	REF. SYMBOL NO.	PART NO.	ITEM NO.
W301	B111985	100	XV202	TS102P01	404	XV403	TS103P01	626
W302	B111986	258	XV203	TS103P01	405	XV404	TS102P01	638
W303	B112008-2	87	XV204	TS103P01	407	XV405	TS102P01	637
W304	B112008-1	91	XV205	TS102P01	406	XV406	TS101P01	615
W305	B116408	322	XV206	TS102P01	470	XV407	TS103P01	625
W601	B116397	11	XV207	TS102P01	471	XV408	TS102P01	636
W701	B116390	7	XV208	TS103P01	472	XV410	TS101P01	617
XCR501	UG-119/UP	312	XV209	TS102P01	474			
XDS401	LH50PR5	69	XV210	TS103P01	473			
XDS402	LH64PA5	70	XV211	TS102P01	475			
XF401	FHN20G	58	XV301	TS102P01	191			
XF402	FHN20G	59	XV302	TS102P01	190			
XF403	FHN20G	60	XV303	TS102P01	187			
XF404	FHN20G	61	XV304	TS103P01	188			
XF405	FHN20G	62	XV305	TS102P01	189			
XF406	FHN20G	63	XV306	TS102P01	186			
XV101	TS102P01	367	XV307	B116396	301			
XV102	TS102P01	366	XV401	TS101P01	606			
XV103	TS102P01	365	XV402	TS101P01	616			





## SECTION X

## DRAWINGS

10-1. DRAWINGS AND PHOTOGRAPHS. (See list of illustrations.)

10-2. CABLING DIAGRAM. (see figure 10-1.) This diagram indicates mating plugs, connectors, and the destination of each cable. This information is very helpful in determining the proper connection for plugs or connections which have been disconnected and where a doubt exists as to their proper destination.

10-3. FUNCTIONAL BLOCK DIAGRAM. (see figure 10-18.) The simplified functional block diagram to which reference is made pertains to the trainer as a complete unit. The diagram indicates circuit and tube functions, tube types, reference symbol numbers, and signal flow information. See Section VI,

Theory of Operation, for a description of the circuitry involved.

10-4. SCHEMATIC DIAGRAM. (See figure 10-19.) The schematic diagram illustrates the electrical wiring of the trainer. It also provides signal flow information, component reference numbers and values, connector pin and wiring details, waveshapes and other information helpful in maintaining the trainer.

10-5. ALPHABETICAL INDEX. The alphabetical index in this section lists all subjects and illustrations mentioned or described in this handbook. Reference is made to their corresponding page and paragraph or figure number.

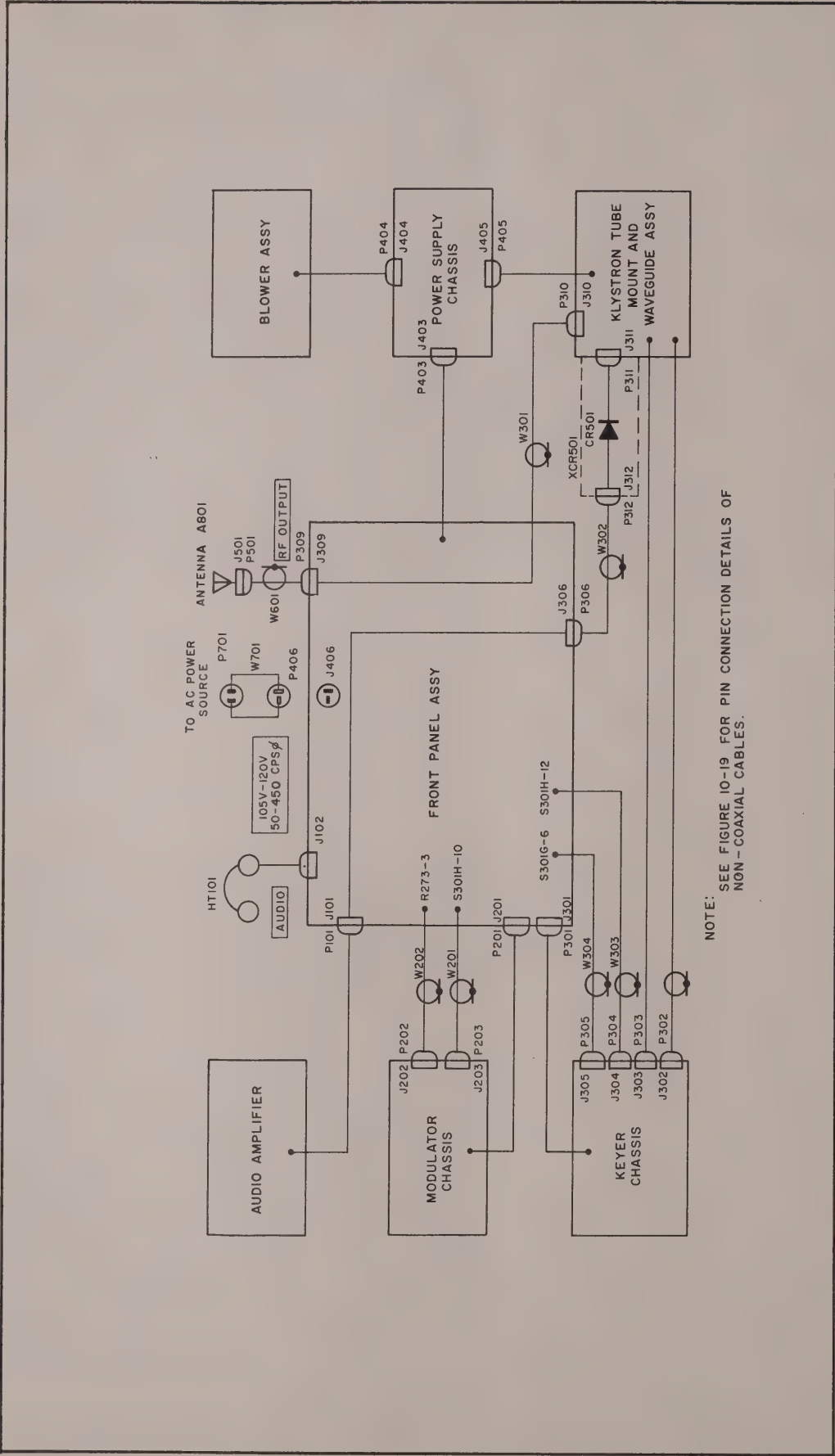


Figure 10-1. Trainer Cabling Diagram



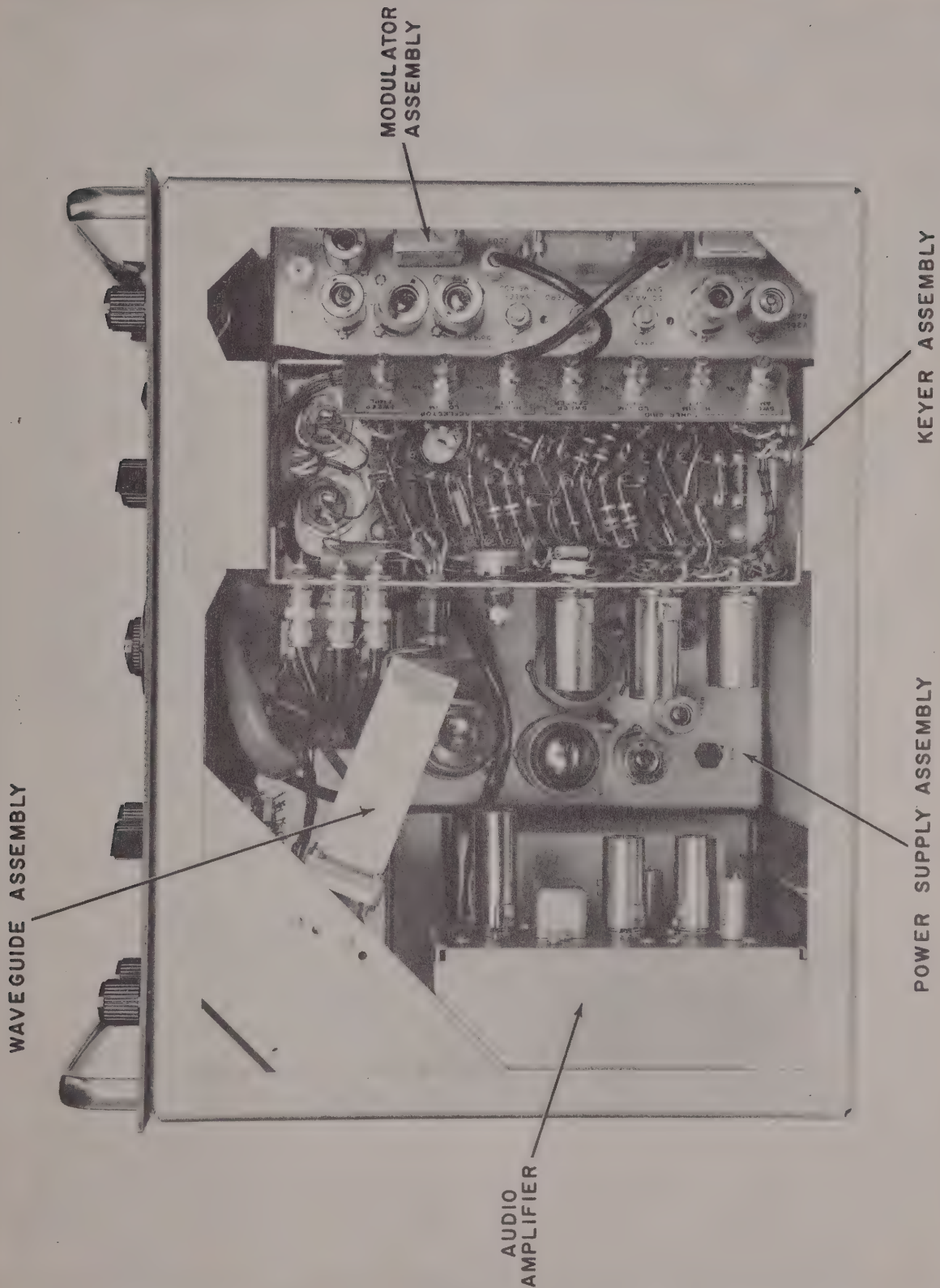


Figure 10-2. Trainer Less Blower Assembly and Dust Cover, Top View

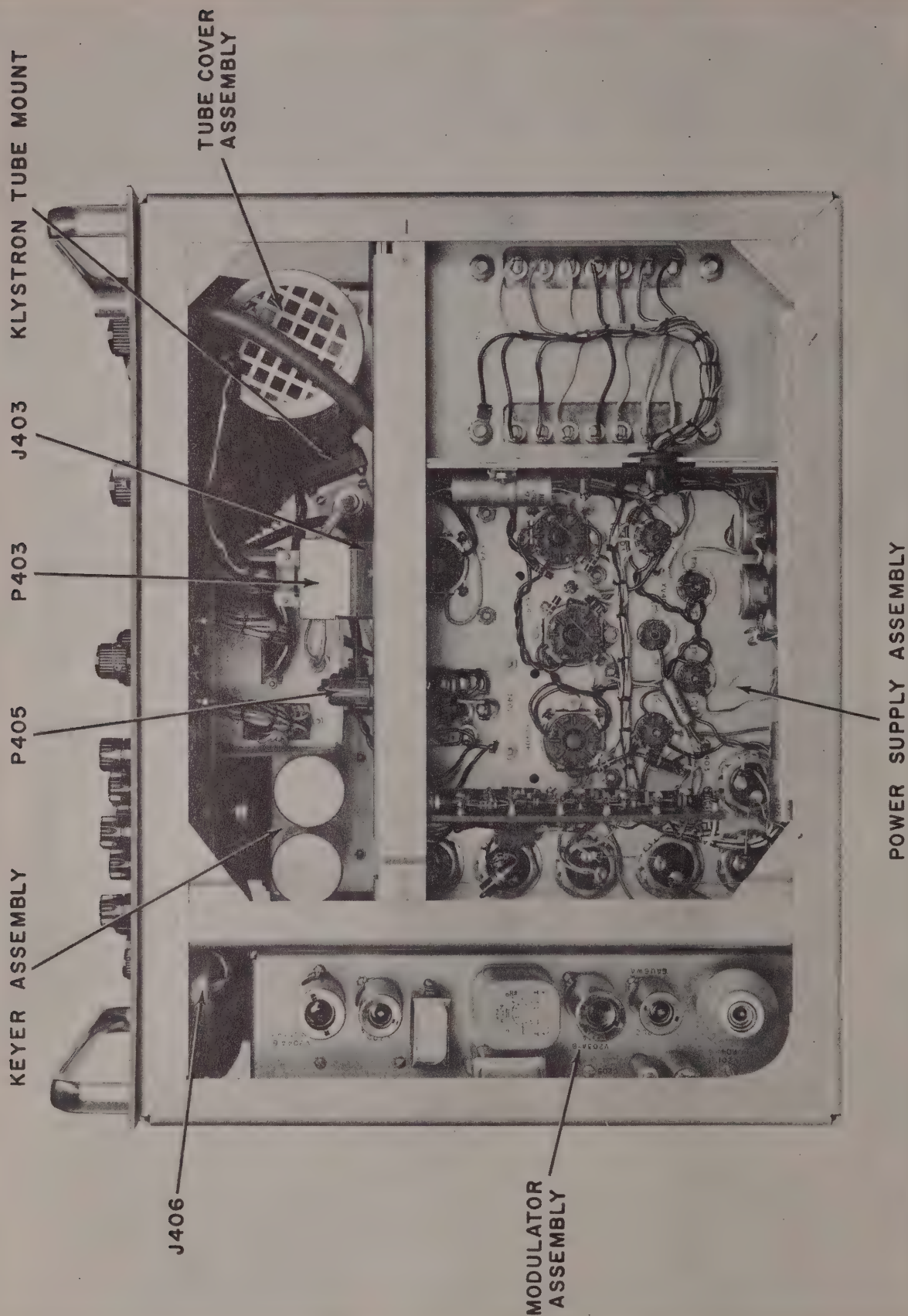
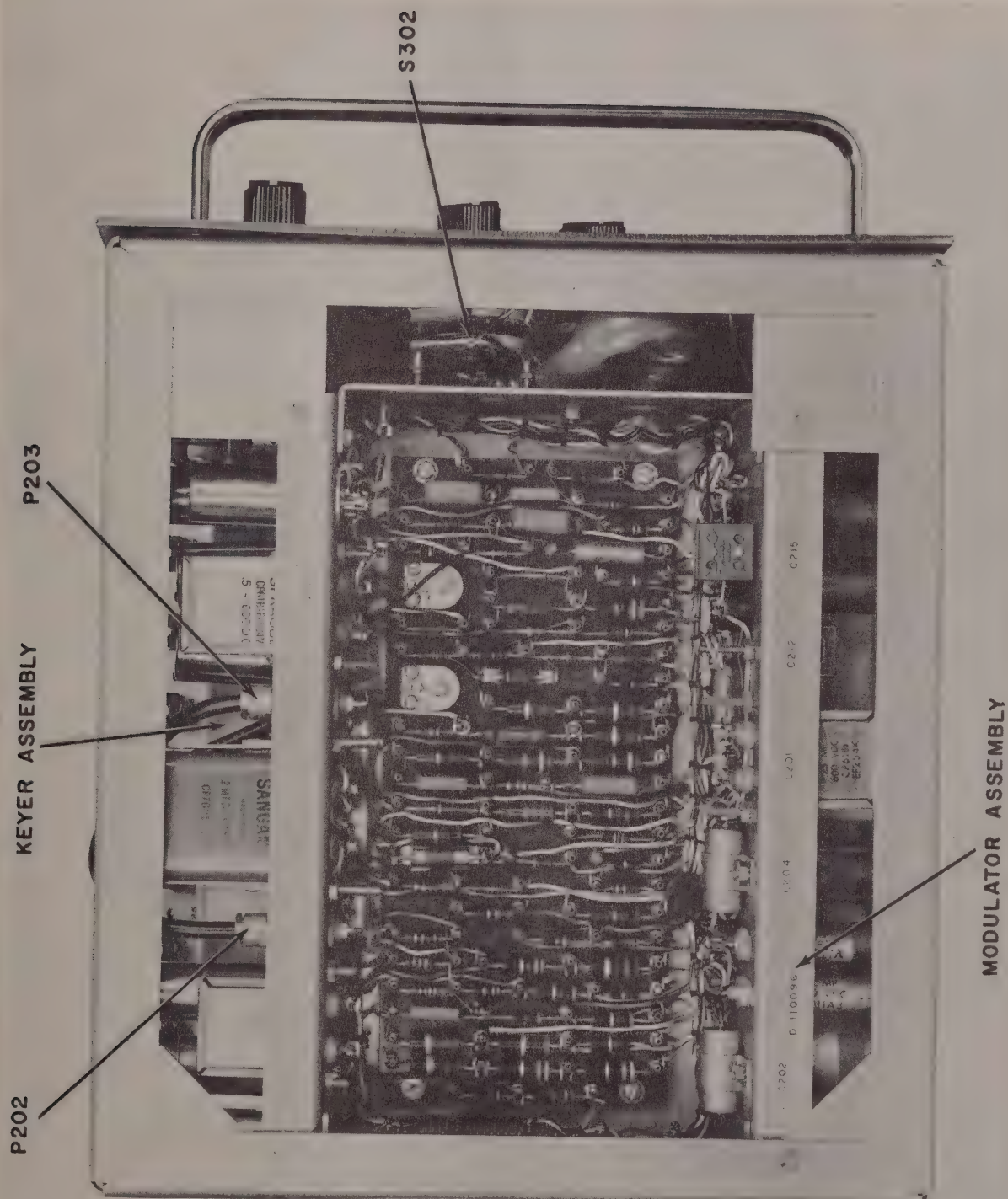


Figure 10-3. Trainer Less Dust Cover, Bottom View





**Figure 10-4. Trainer Less Dust Cover, Left Side View**



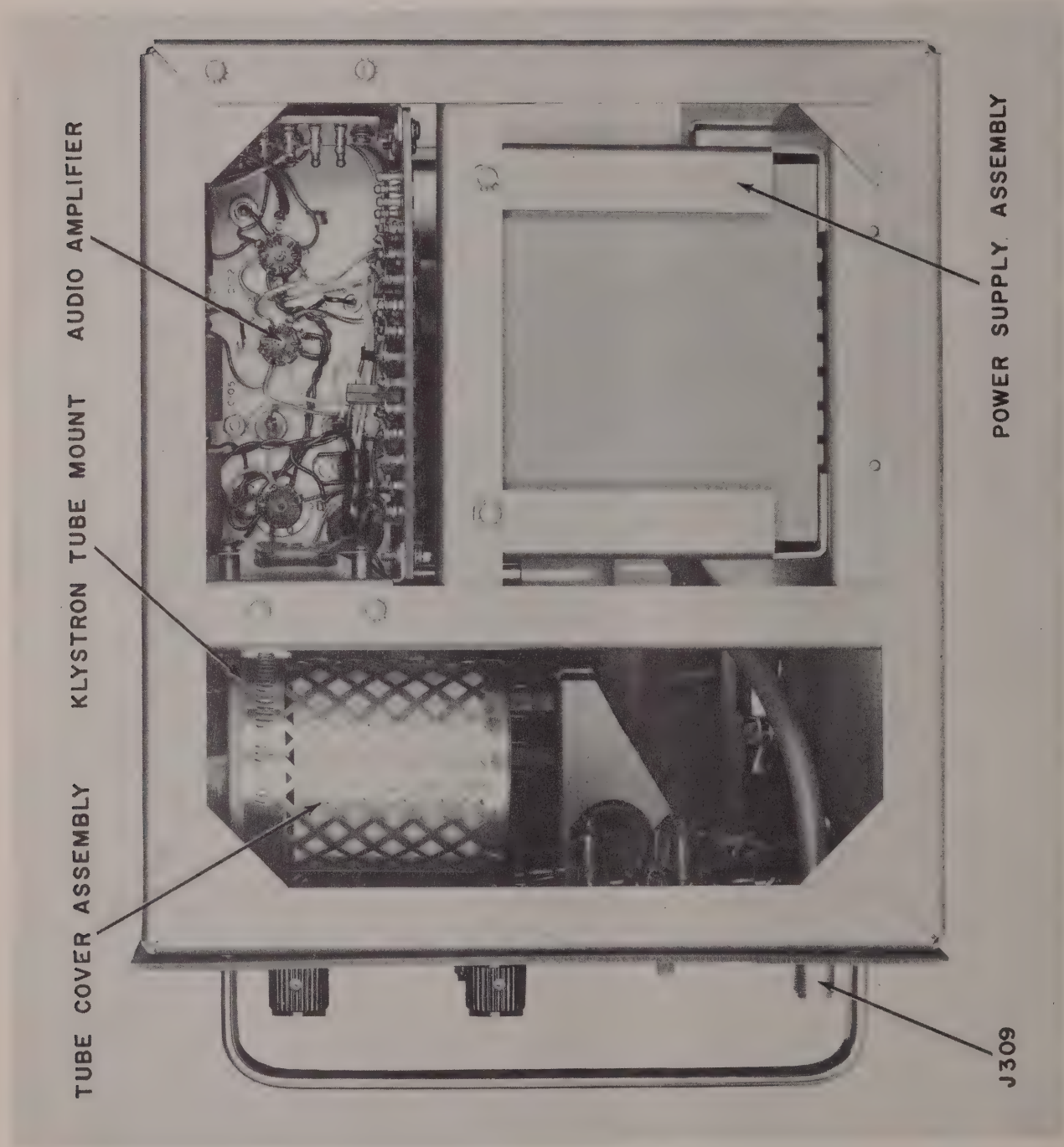


Figure 10-5. Trainer Less Dust Cover, Right Side View

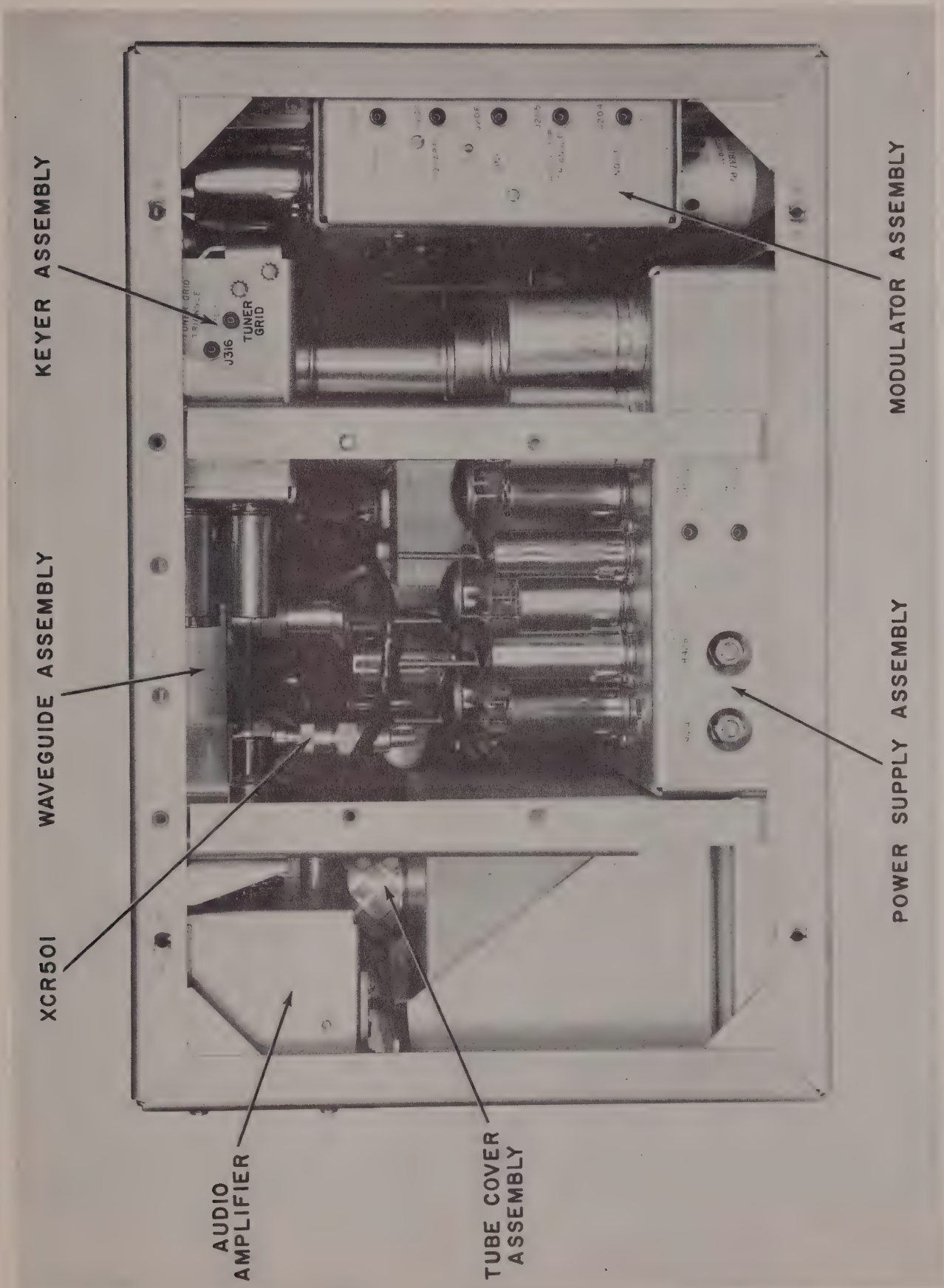


Figure 10-6. Trainer Less Blower Assembly and Dust Cover, Rear View



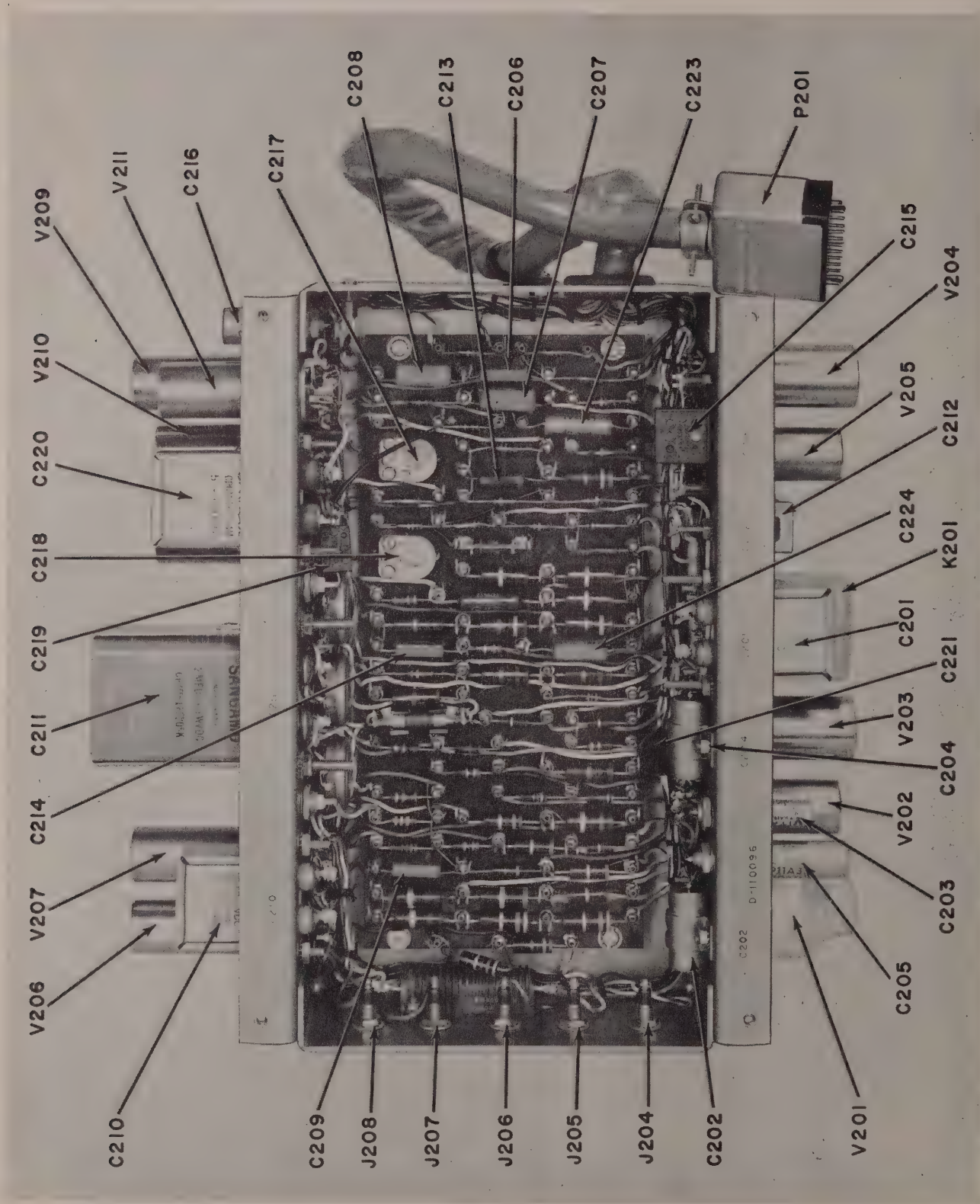
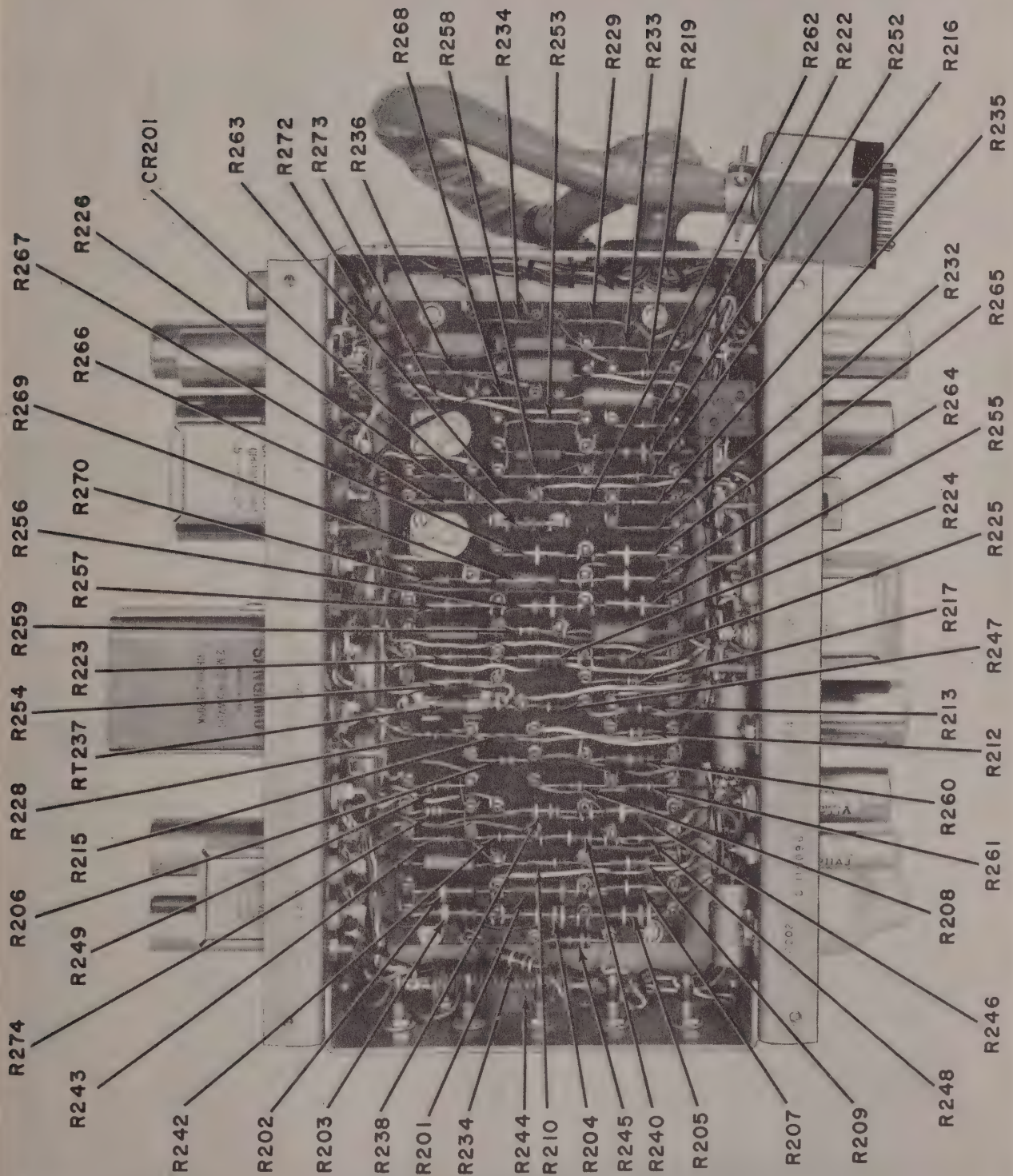


Figure 10-7. Modulator Chassis, Bottom View (Sheet 1 of 2)





**Figure 10-7. Modulator Chassis, Bottom View (Sheet 2 of 2)**

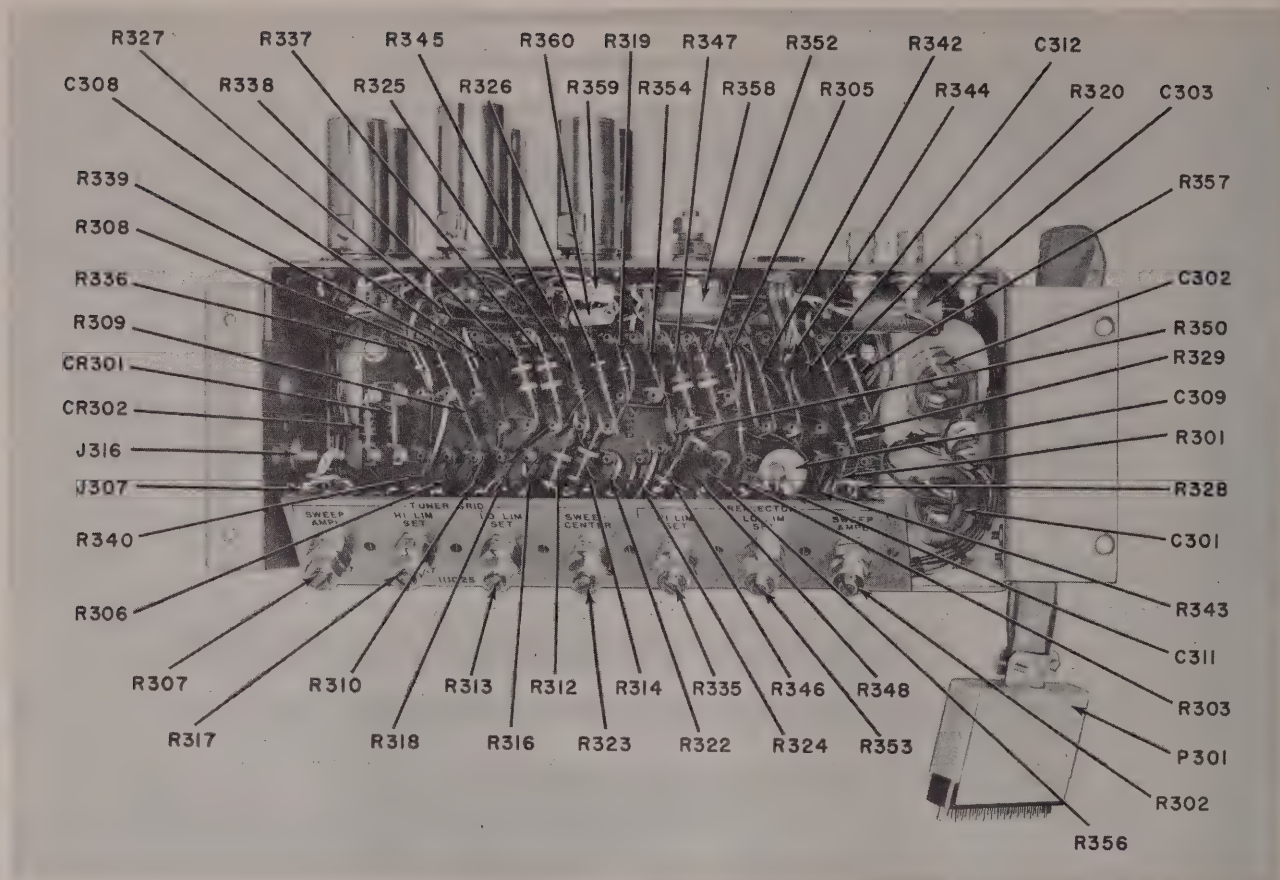


Figure 10-8. Keyer Chassis, Bottom View

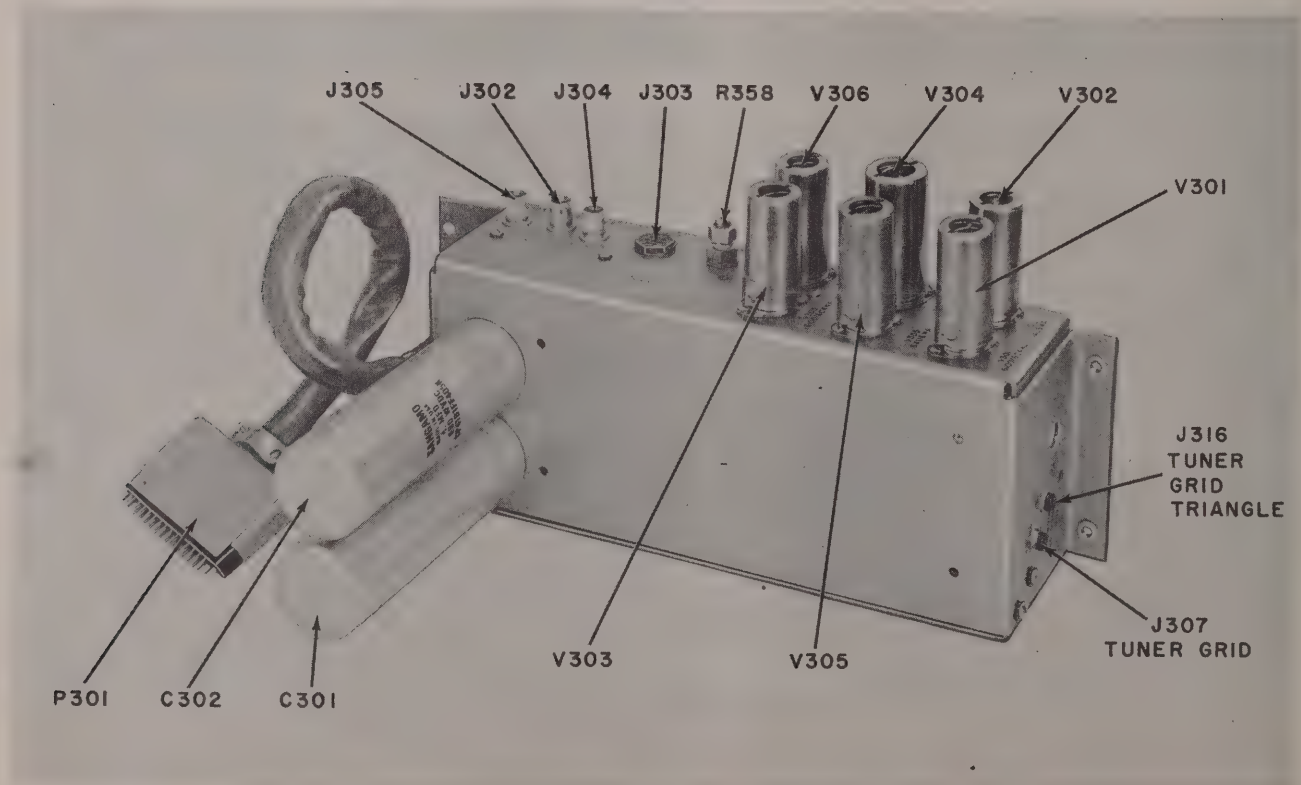


Figure 10-9. Keyer Chassis, Oblique View



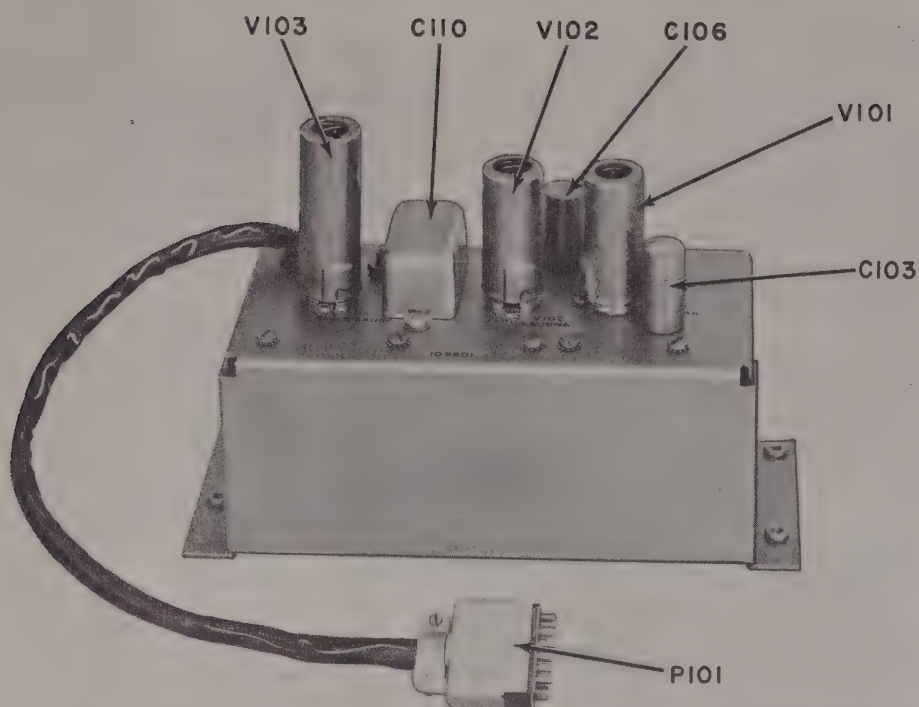


Figure 10-10. Audio Amplifier Chassis, Top View

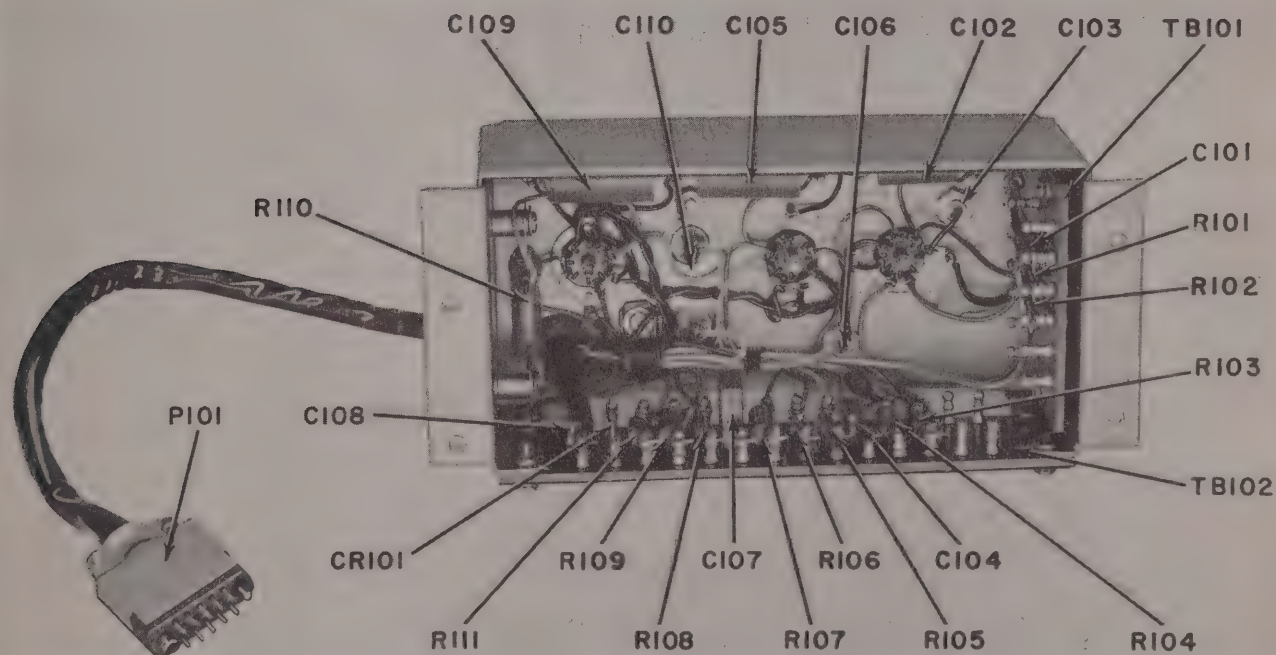


Figure 10-11. Audio Amplifier Chassis, Bottom View



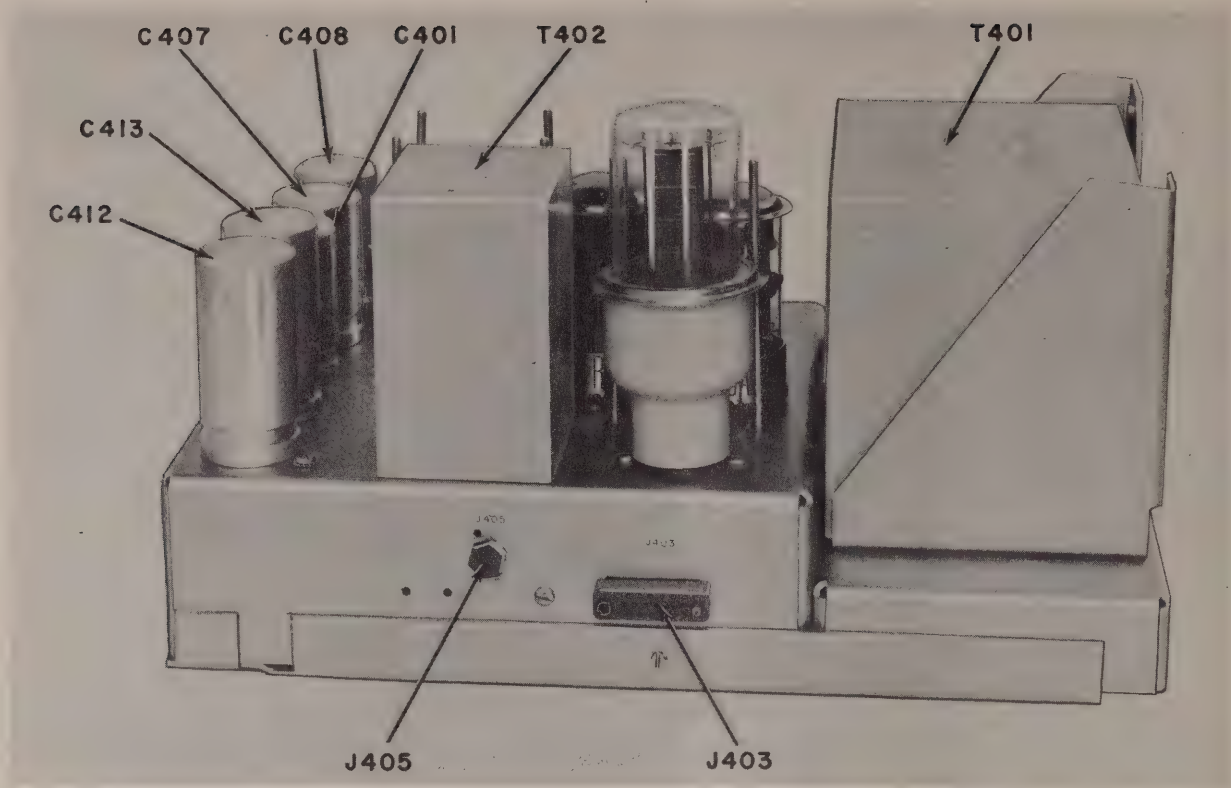


Figure 10-12. Power Supply Chassis, Front Top View

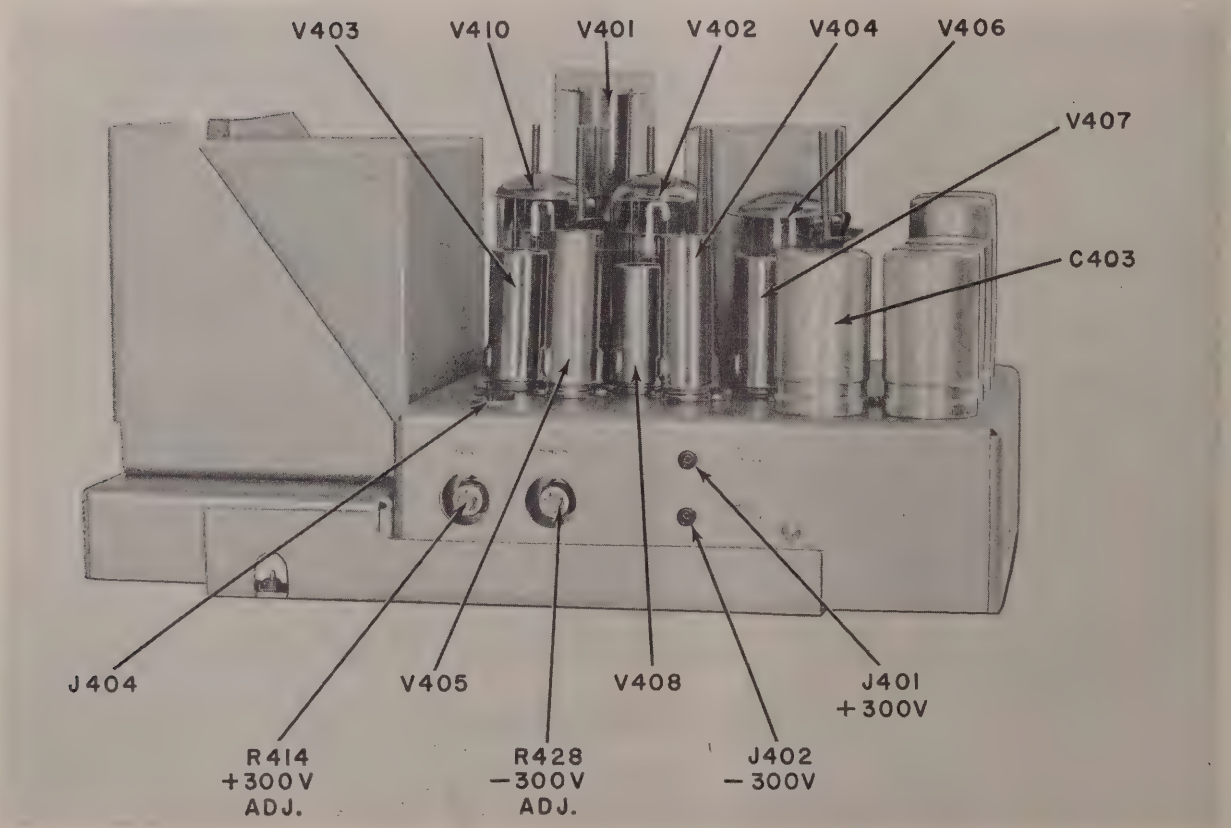


Figure 10-13. Power Supply Chassis, Rear Top View

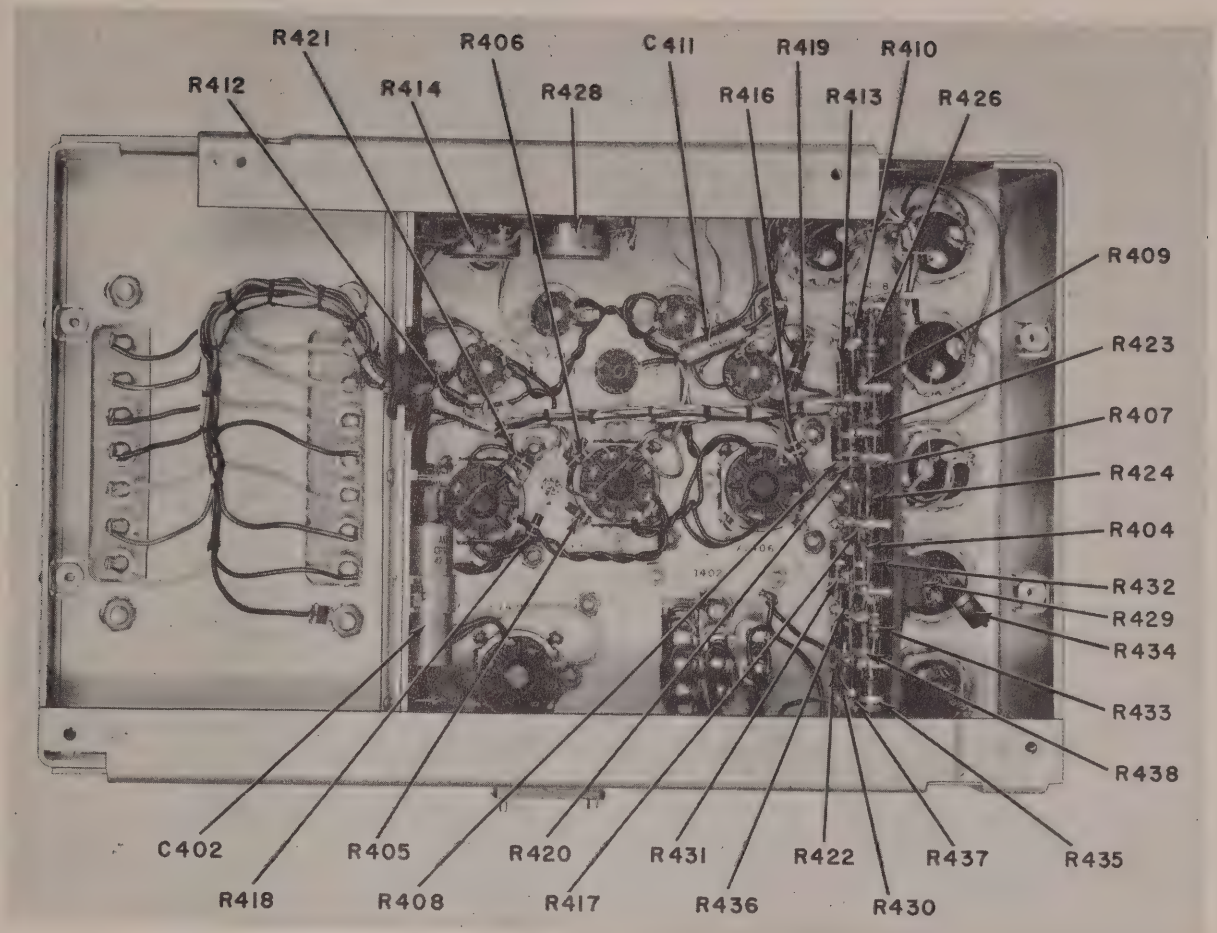


Figure 10-14. Power Supply Chassis, Bottom View

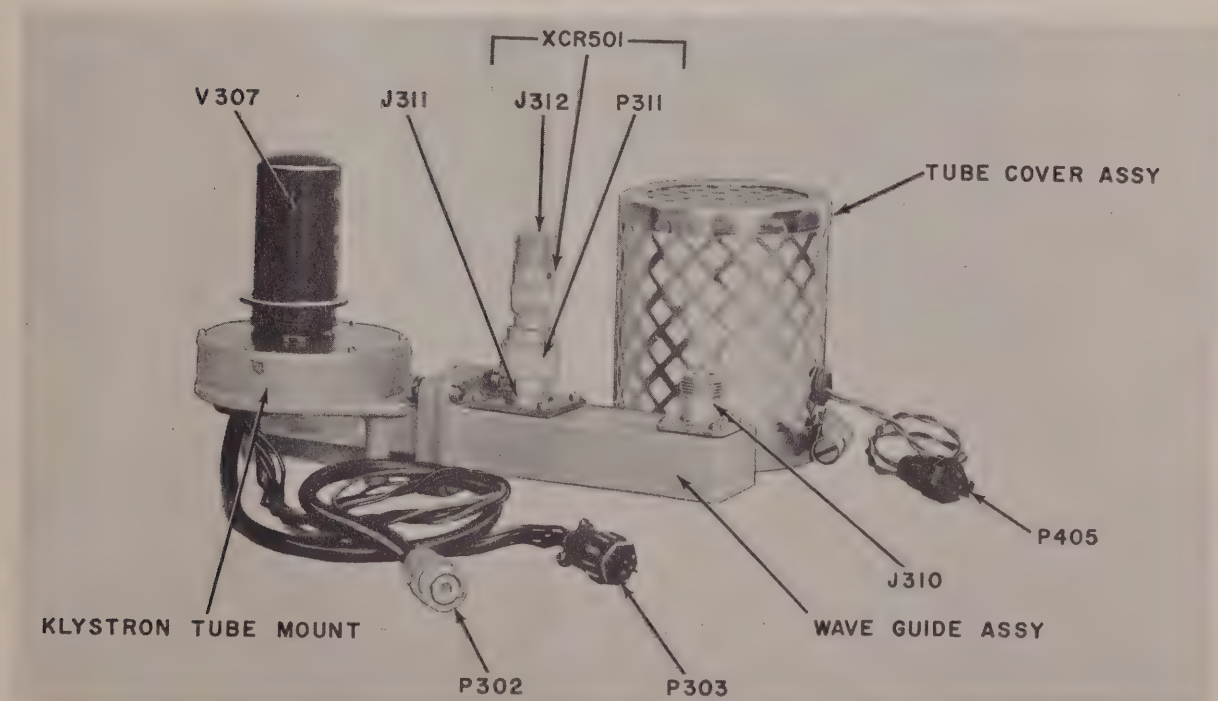


Figure 10-15. Klystron Tube Mount and Waveguide Assembly



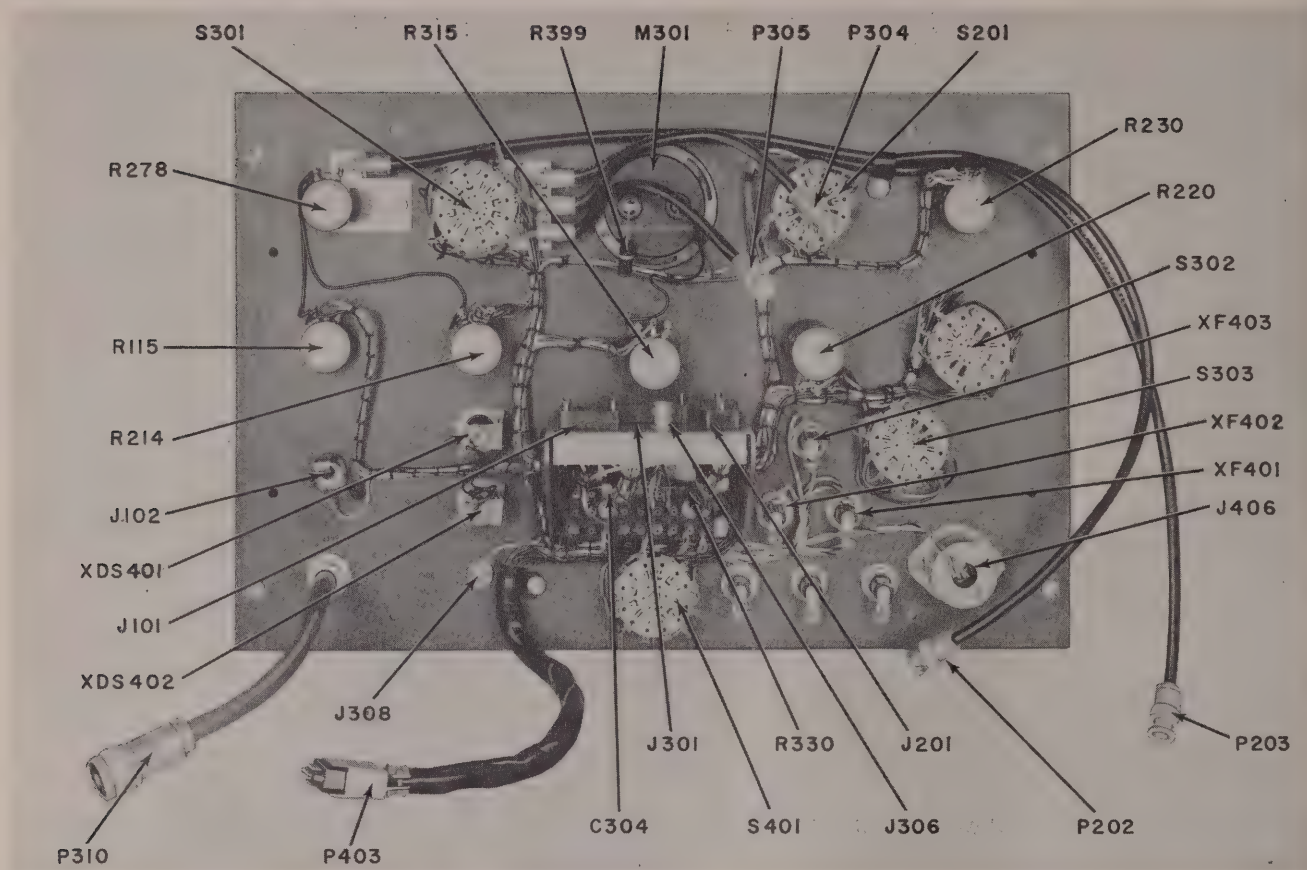


Figure 10-16. Front Panel, Rear View

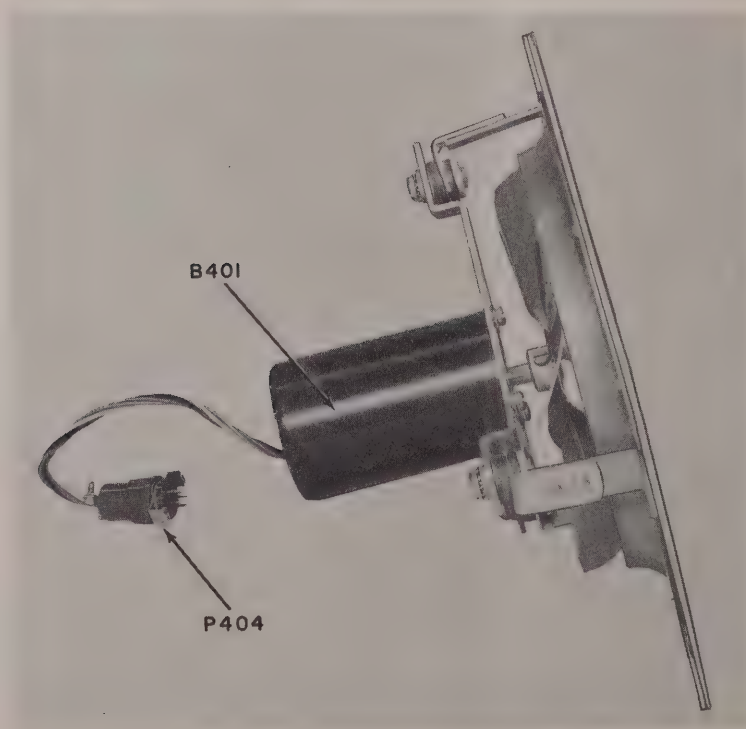
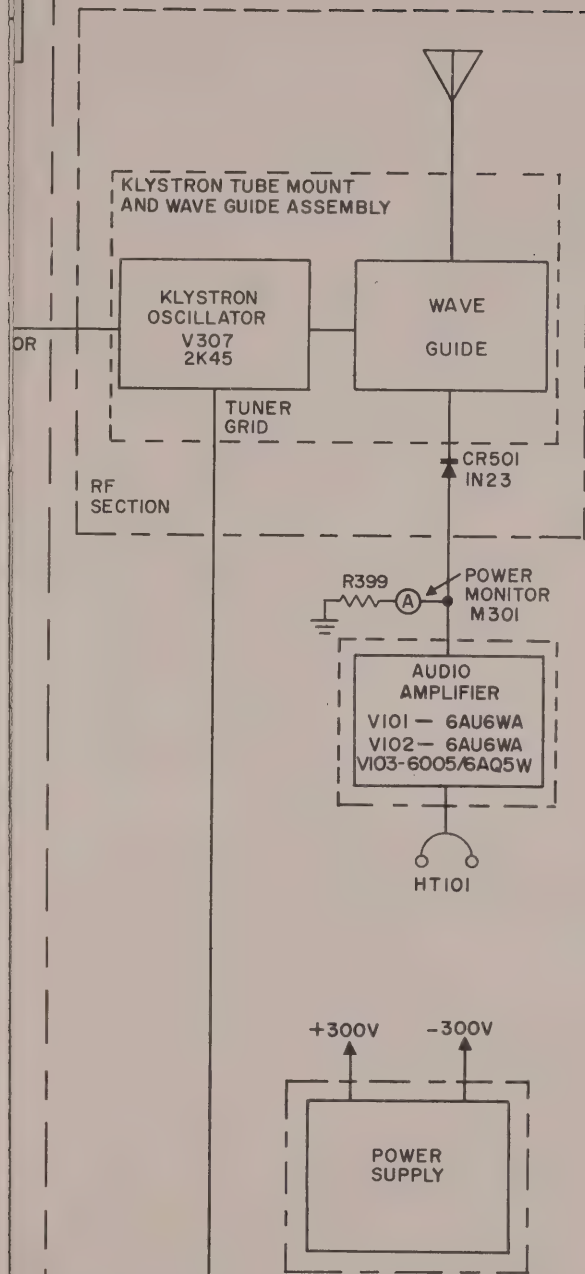


Figure 10-17. Blower





inner (X-Band) Device 15X12,  
Diagram

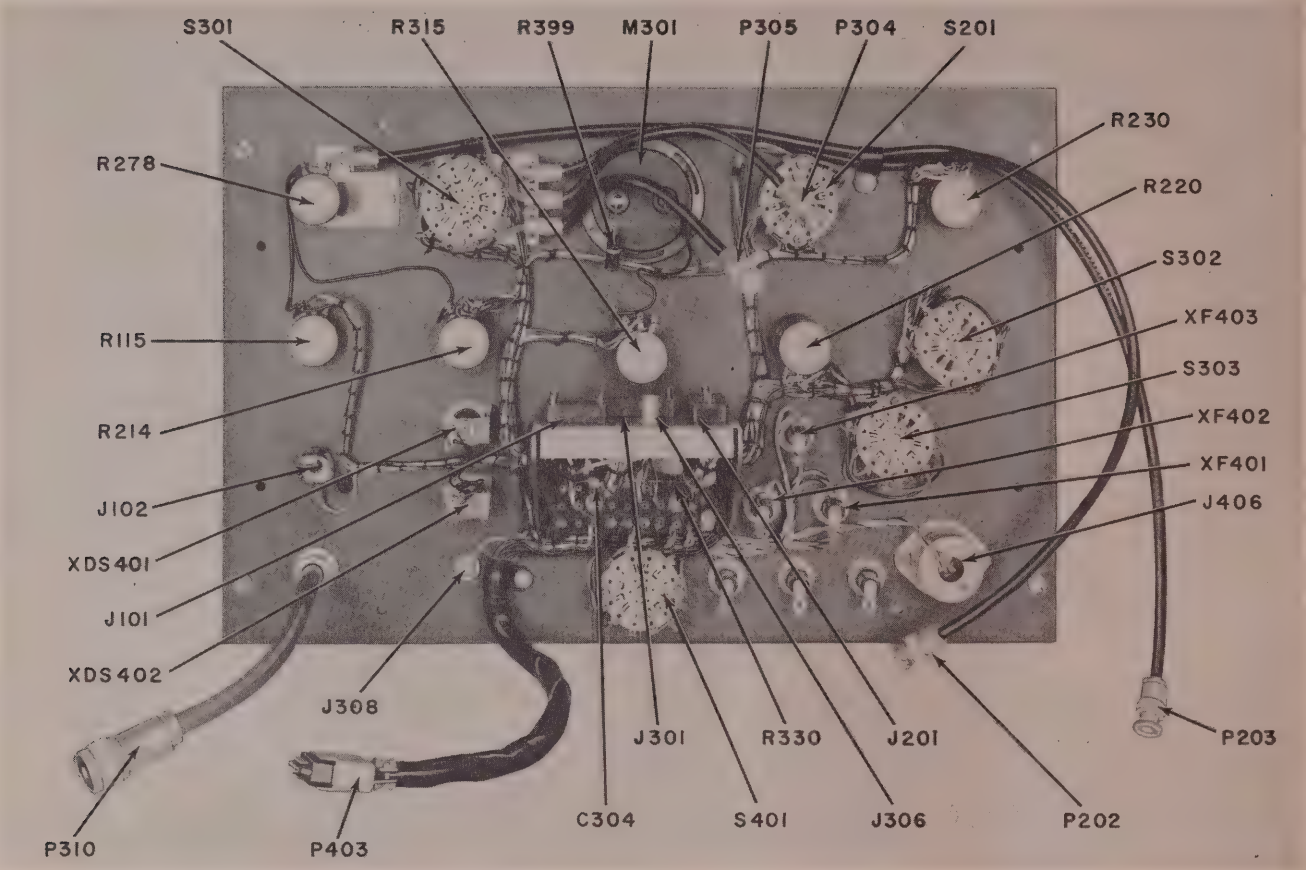


Figure 10-16. Front Panel, Rear View

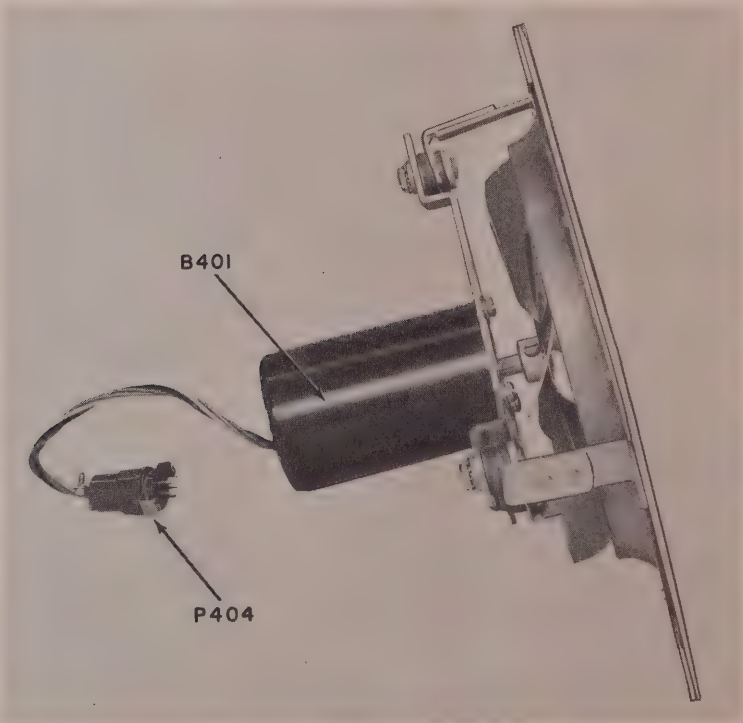


Figure 10-17. Blower

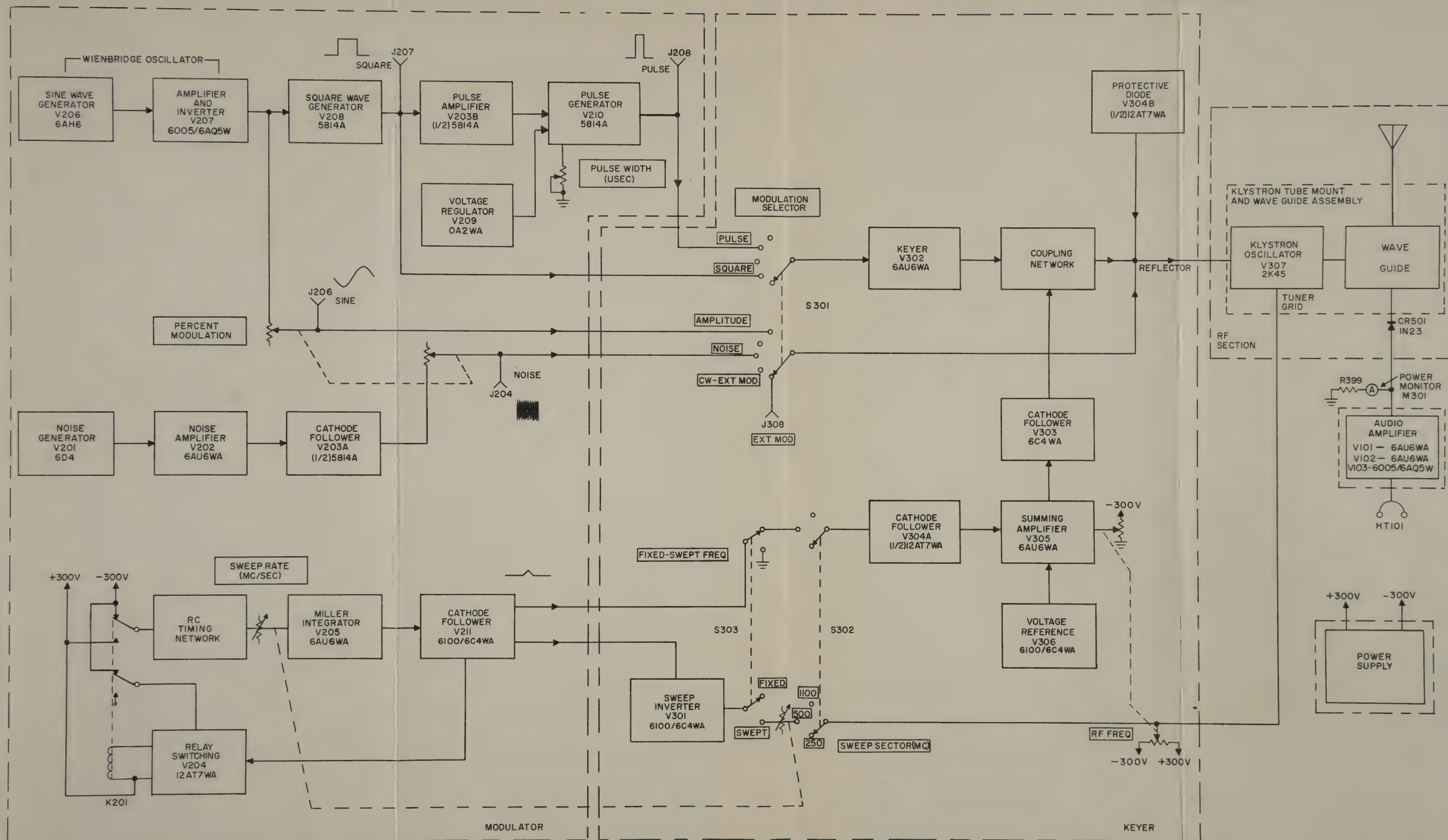


Figure 10-18. Radar Signal Interference Trainer (X-Band) Device 15X12, Simplified Functional Block Diagram



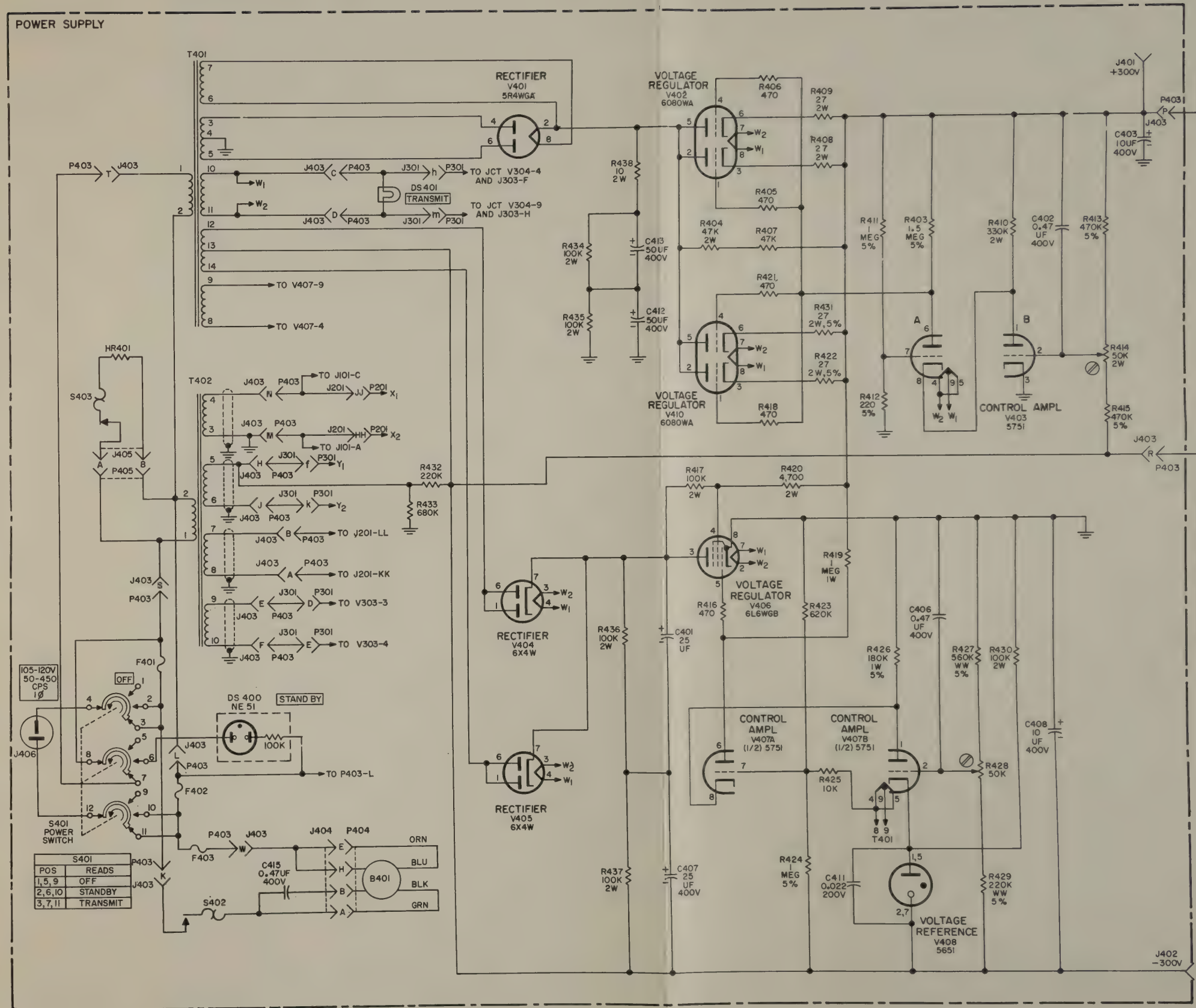


J2  
TO R214A-3  
TO JCT R214A-2  
AND S301G-5  
TO R220A-3  
TO R220B-1  
TO S301D-11  
TO S303-8  
TO JCT S302A-4  
AND J301-f  
TO JCT S302B-10  
AND J301-d  
TO JCT S301C-6  
J301-P AND P403-R  
TO S303-5  
TO JCT S301E-2,  
S301E-3, S301E-4  
TO JCT S301F-9  
AND S301F-10  
TO S301D-10  
TO S301A-6  
TO S301H-9  
TO GRD  
TO R214B-3  
TO JCT R214B-2  
AND S301G-2  
TO S201-3B  
TO JCT S201-A  
AND S301B-8  
TO S201-2B  
TO JCT S301A-2,  
S201-1B & R230A-3  
TO JCT R230A-1  
AND R230A-2  
TO S201-3A  
TO S201-2A  
TO R230B-3  
TO JCT R230B-1  
AND R230B-2  
TO S201-1A  
TO JCT DS402,  
J101-A AND P403-M  
TO JCT DS402,  
J101-C AND P403-N  
TO P403-A  
TO P403-B  
TO S301B-12

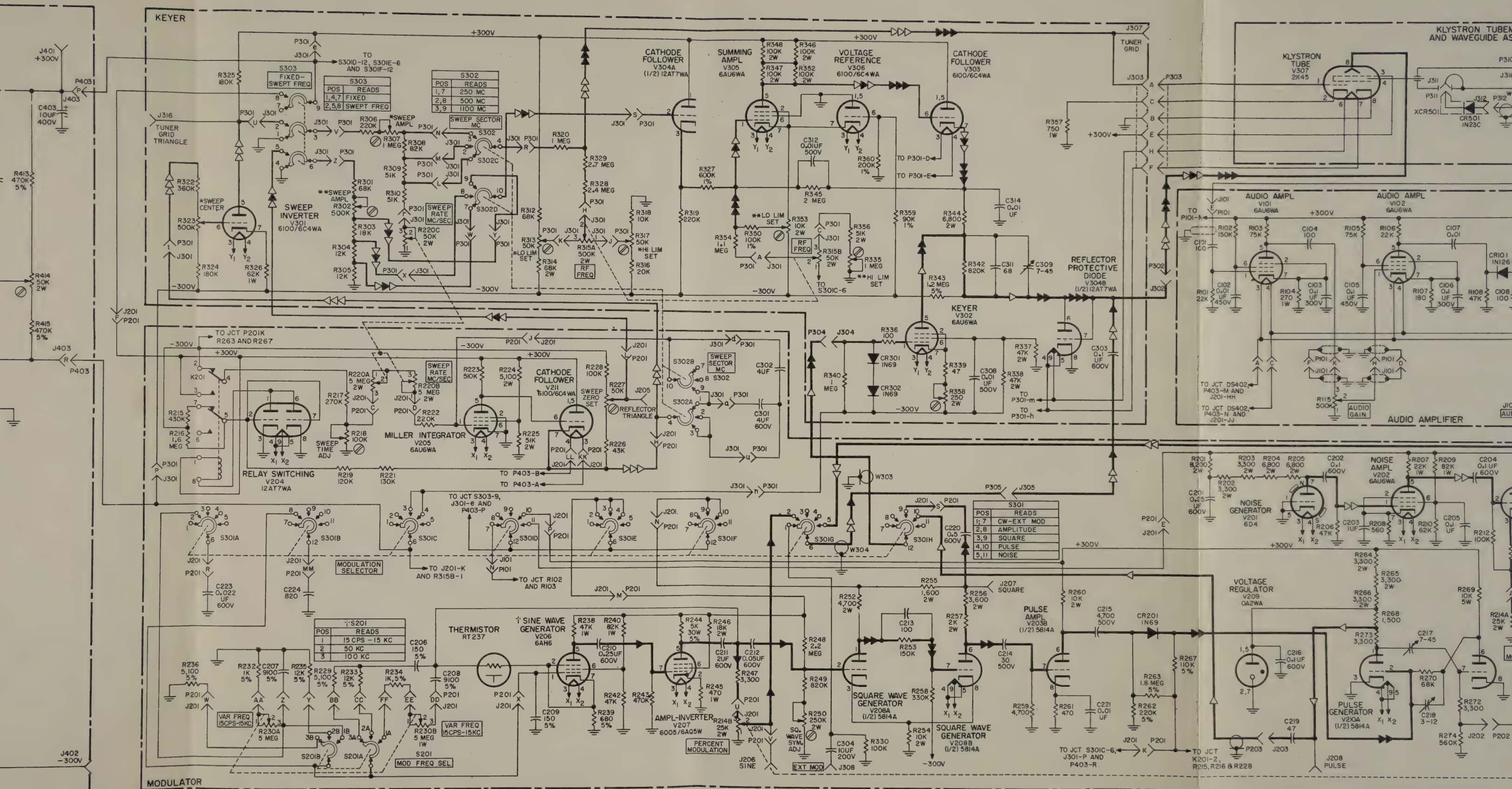
J2



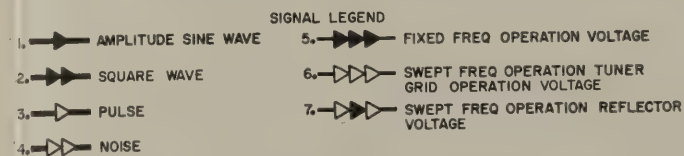
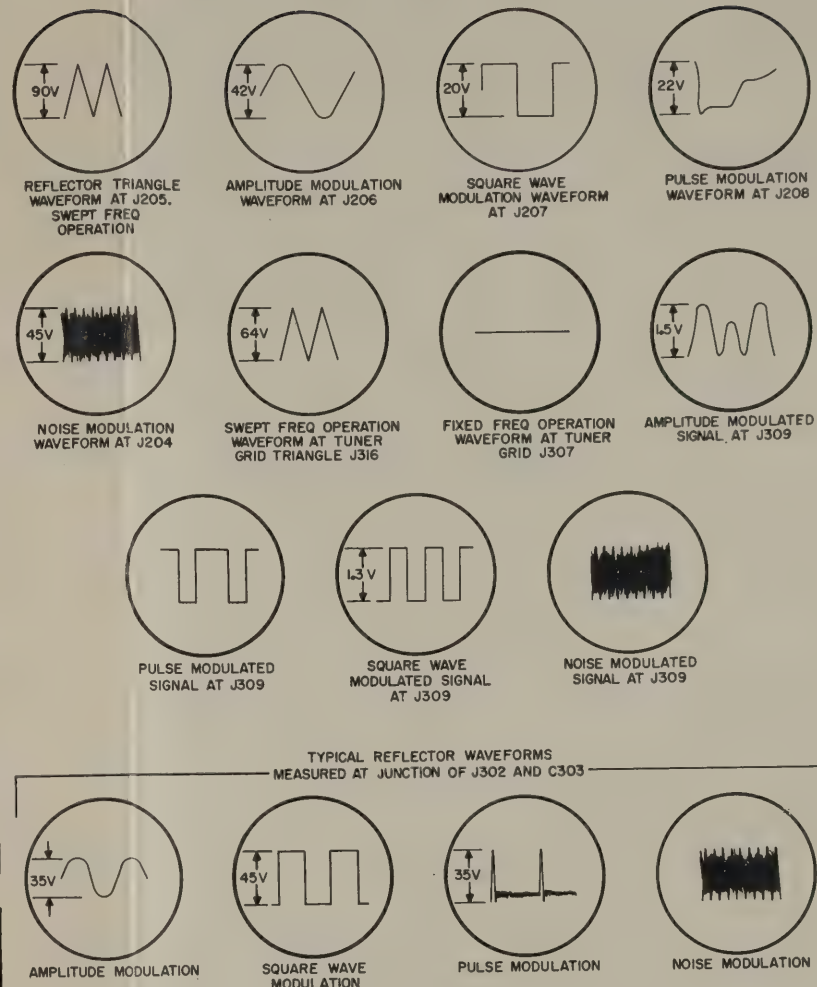
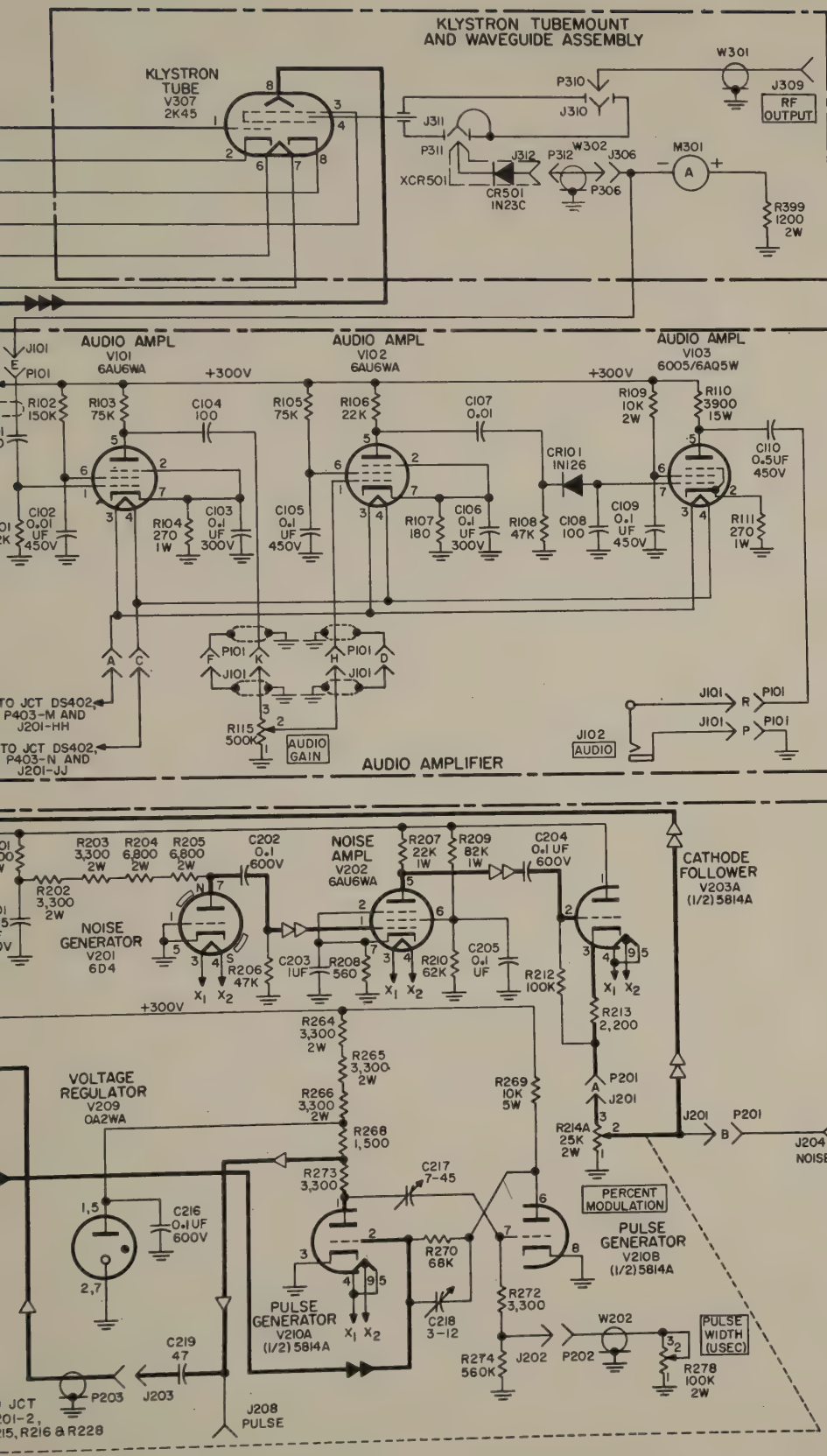












## NOTES

- UNLESS OTHERWISE INDICATED:  
 A. ALL CAPACITANCE VALUES ARE IN MICROMICROFARADS.  
 B. ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT RATING (K=1000, MEG=1,000,000), ±10%.
- ALL RELAYS SHOWN ARE IN DE-ENERGIZED POSITION.
- DENOTES FRONT PANEL MARKING.
- ⊗ DENOTES SCREWDRIVER ADJUSTMENT.
- \* DENOTES TUNER GRID ADJUSTMENT.
- \*\* DENOTES REFLECTOR ADJUSTMENT.
- † DENOTES THAT V206 OSCILLATES AT 1/2 S201 PANEL FREQUENCY DESIGNATION, WITH S301 ROTATED TO AMPLITUDE.
- SEE FIGURE 10-1 FOR FRONT PANEL AND INTERCONNECTING CABLE DIAGRAM.

Figure 10-19. Radar Signal Interference Trainer (X-Band)  
 Device 15X12, Schematic Diagram





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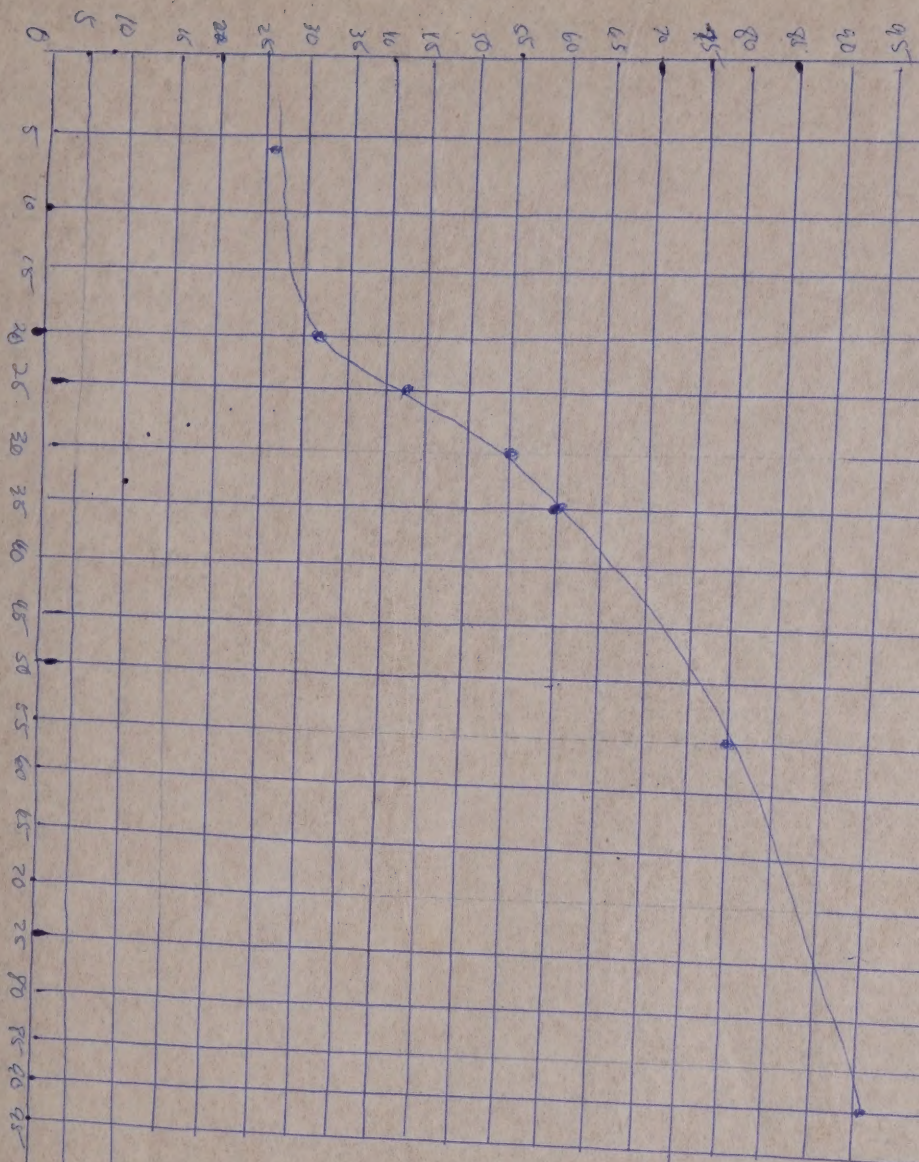
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TTR



Smaller Top



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